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13 June 1980

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 48

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FRENCH FIRM GRANTED LEASE TO MINE URANIUM IN AUSTRALIA

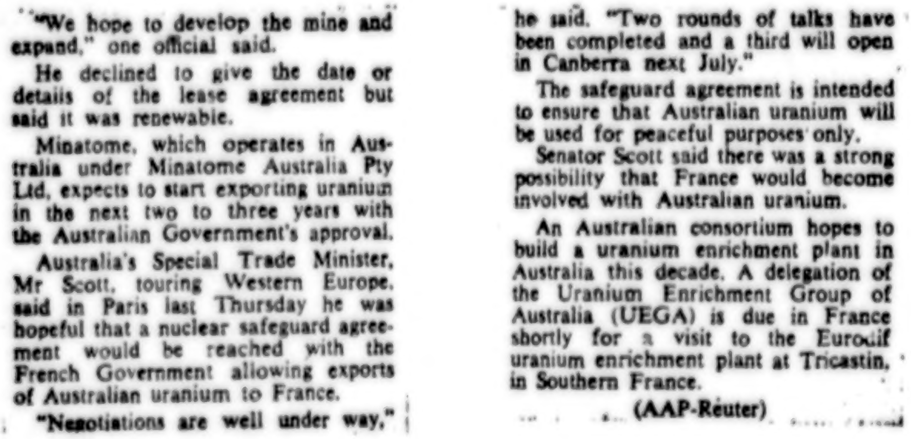
Report from Paris

Sydney THE SYDNEY MORNING HERALD in English 13 May 80 p 13

[Text] Paris, Monday.--The French mining company Minatome has won a uranium mining lease in Queensland, the first such lease granted to a French concern, company officials said today.

The Queensland Government granted the lease at Ben Lomond, 60km west of Townsville.

Minatome, subsidiary of two French giants, Pechiney Ugine Kuhlman (PUK) and Compagnie Francaise Des Petroles (CFP), has discovered uranium deposits in a 10-square kilometre area at Ben Lomond.



"We hope to develop the mine and expand," one official said.

He declined to give the date or details of the lease agreement but said it was renewable.

Minatome, which operates in Australia under Minatome Australia Pty Ltd, expects to start exporting uranium in the next two to three years with the Australian Government's approval.

Australia's Special Trade Minister, Mr Scott, touring Western Europe, said in Paris last Thursday he was hopeful that a nuclear safeguard agreement would be reached with the French Government allowing exports of Australian uranium to France.

"Negotiations are well under way," he said. "Two rounds of talks have been completed and a third will open in Canberra next July."

The safeguard agreement is intended to ensure that Australian uranium will be used for peaceful purposes only.

Senator Scott said there was a strong possibility that France would become involved with Australian uranium.

An Australian consortium hopes to build a uranium enrichment plant in Australia this decade. A delegation of the Uranium Enrichment Group of Australia (UEGA) is due in France shortly for a visit to the Eurodif uranium enrichment plant at Tricastin, in Southern France.

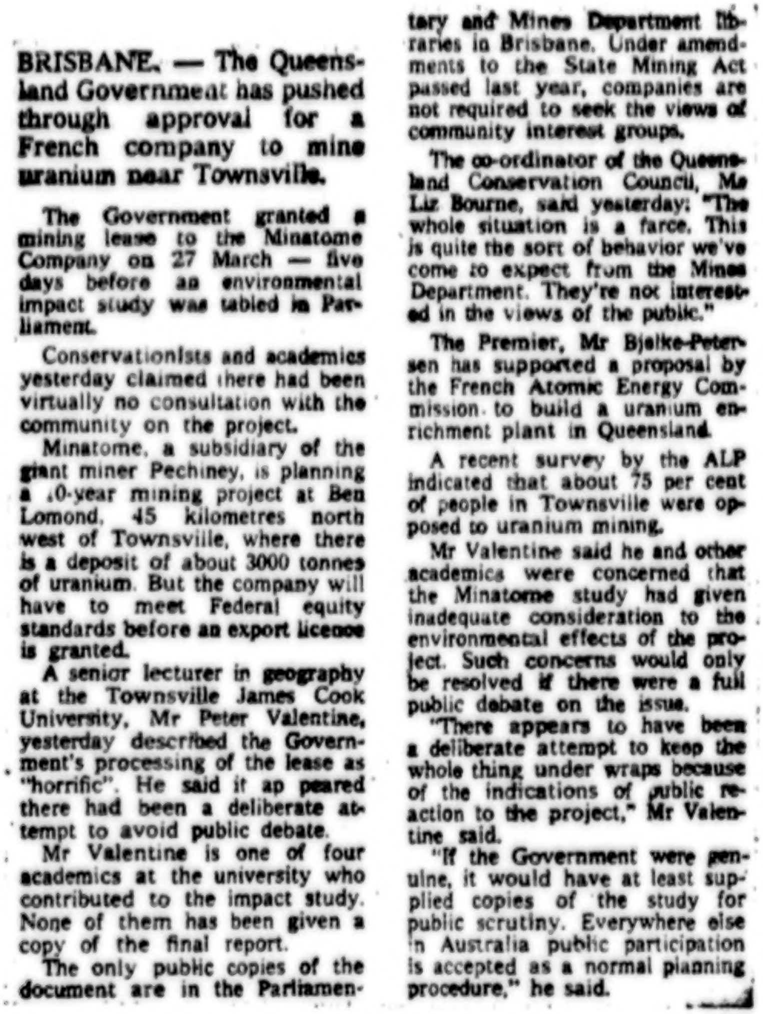
(AAP-Reuter)

Reaction in Brisbane

Melbourne THE AGE in English 13 May 80 p 3

[Report from Mark Baker]

[Text]



BRISBANE. — The Queensland Government has pushed through approval for a French company to mine uranium near Townsville.

The Government granted a mining lease to the Minatome Company on 27 March — five days before an environmental impact study was tabled in Parliament.

Conservationists and academics yesterday claimed there had been virtually no consultation with the community on the project.

Minatome, a subsidiary of the giant miner Pechiney, is planning a 10-year mining project at Ben Lomond, 45 kilometres north west of Townsville, where there is a deposit of about 3000 tonnes of uranium. But the company will have to meet Federal equity standards before an export licence is granted.

A senior lecturer in geography at the Townsville James Cook University, Mr Peter Valentine, yesterday described the Government's processing of the lease as "horrific". He said it appeared there had been a deliberate attempt to avoid public debate.

Mr Valentine is one of four academics at the university who contributed to the impact study. None of them has been given a copy of the final report.

The only public copies of the document are in the Parliamentary and Mines Department libraries in Brisbane. Under amendments to the State Mining Act passed last year, companies are not required to seek the views of community interest groups.

The co-ordinator of the Queensland Conservation Council, Ms Liz Bourne, said yesterday: "The whole situation is a farce. This is quite the sort of behavior we've come to expect from the Mines Department. They're not interested in the views of the public."

The Premier, Mr Bjelke-Petersen has supported a proposal by the French Atomic Energy Commission to build a uranium enrichment plant in Queensland.

A recent survey by the ALP indicated that about 75 per cent of people in Townsville were opposed to uranium mining.

Mr Valentine said he and other academics were concerned that the Minatome study had given inadequate consideration to the environmental effects of the project. Such concerns would only be resolved if there were a full public debate on the issue.

"There appears to have been a deliberate attempt to keep the whole thing under wraps because of the indications of public reaction to the project," Mr Valentine said.

"If the Government were genuine, it would have at least supplied copies of the study for public scrutiny. Everywhere else in Australia public participation is accepted as a normal planning procedure," he said.

CSO: 5100

JAPAN'S OKITA, CANADA'S MACGUIGAN DISCUSS REACTOR, TRADE ISSUES

OW060131 Tokyo KYODO in English 0032 GMT 6 May 80

[Text] Ottawa May 5 KYODO--Canadian External Affairs Minister Mark MacGuigan told Japanese Foreign Minister Saburo Okita here Monday that Canada is still strongly interested in exporting its Candu heavy-water type nuclear reactor to Japan. Okita, however, refrained from making an immediate reply to MacGuigan's proposal during their talks here lasting about an hour, according to Japanese officials.

The introduction to Japan of the Canadian-developed nuclear reactor is still a pending issue in Japan because of differences of views between the Ministry of International Trade and Industry and the Japan Atomic Energy Commission.

The Japanese foreign minister arrived here earlier Monday accompanying Prime Minister Masayoshi Ohira on a three-day official visit following visits to the United States and Mexico.

On other bilateral issues, MacGuigan told Okita that Canada welcomes Japanese capital investments in his country. At the same time, however, MacGuigan expressed his hope that Japan import more manufactured goods and agricultural products from Canada, the officials said. They said Okita replied he fully understood Canada's position in respect to bilateral trade and revealed Japan is making efforts to increase its imports of Canadain manufactured goods.

Okita also said that Japan hopes to import steaming coal and natural gas from Canada, according to the officials. They said the Canadian foreign minister told Okita that Canada is capable of exporting steaming coal to Japan. But he was quoted as saying that Canada has no surplus natural gas for export at present.

The [words indistinct] that the Japanese and Canadian foreign ministers agreed to hold consultations annually in the future. Okita is scheduled to leave here Monday night (Tuesday morning Japan time) for New York for consultation with U.N. Secretary General Kurt Waldheim on the Iranian hostage problems. He will rejoin Ohira in Vancouver Tuesday (Wednesday Japan time).

CSO: 5100

MEXICAN OFFICIALS DENY CONCLUSION OF NUCLEAR DEAL WITH FRANCE

PA181954 Madrid EFE in Spanish 1712 GMT 18 May 80

[Text] Paris, 18 May (EFE)--France "will not build three nuclear centers in Mexico," a spokesman for the embassy of that Latin American country told EFE here today. The nuclear construction agreement had been announced this morning by a news agency but the report was immediately corrected by an official Mexican spokesman.

"Tomorrow only the signing of a cooperation agreement on scientific research will take place in Paris," without at any time mentioning the nuclear aspect, the spokesman said.

Mexican President Jose Lopez Portillo himself told EFE yesterday that "no nuclear agreement was signed" although he did not discount his country's interest in France's technology and that of the other industrialized nations.

Meanwhile, it was reported today to the press that two loans, one for $50 million and the other for $250 million, have been granted to Mexico by two French banks, the "Banque Nationale de Paris" and the "Societe Generale," for period of 5 and 8 years, respectively, at 14 percent interest.

The financial agreement was signed by the two parties this morning in the presence of President Lopez Portillo at Hotel Marigny, private residence reserved by the French Government for the Mexican president during his stay here, which is scheduled to end tomorrow. Lopez Portillo will leave tomorrow for Bonn, the FRG's capital.

CSO: 5100

BRIEFS

CUBA, USSR NUCLEAR CENTER--Cuba and the Soviet Union signed an agreement in Moscow on Thursday for the building of a nuclear research center in our country. The center will be used for the solution of problems of the economy and peaceful use of nuclear energy in Cuba. [Text] [FL161026 Havana Domestic Service in Spanish 1000 GMT 16 May 80]

NUCLEAR POWER STUDY--Indonesia and Italy on 22 April held a meeting in Jakarta to mark the start of a feasibility study for the development of a nuclear-generated electric power station in Indonesia. Indonesia was represented by the National Atomic Energy Agency and the State Electricity Corporation while Italy was represented by a delegation from the Italian Atomic Energy Agency. [Jakarta Domestic Service in Indonesian 0700 GMT 22 Apr 80 BK]

ARGENTINE DEPENDENCY ON FRG--Montevideo, 12 May (AFP)--Rear Adm Carlos Castro Madero stated here today that Argentina's uranium reserves guarantee a 30-year supply for eight nuclear plants and that Argentina is ready to "sever the umbilical cord" of nuclear cooperation with the FRG. The chairman of the Argentine National Atomic Energy Commission, who is attending the conference on reactors which is being held in this city, added that the uranium reserves amount to 27,000 tons and are sufficient to supply eight nuclear plants. In his statement, illustrated with photographs, Castro Madero emphasized that the progress attained by Argentina will allow it to overcome its dependency on the FRG for the manufacture of fuel elements by 1981. [Excerpt] [PY131334 Paris AFP in Spanish 0225 GMT 13 May 80]

USSR HEAVY WATER TO INDIA--The Soviet Union is supplying India 250 tons of heavy water for its atomic powerplants without the precondition of full-scope safeguards. The other possible sources of heavy water supply, namely Canada and the United States, insist upon full-scope safeguards. According to PTI the supply under contract is expected to begin shortly. This is in addition to the 200 tons of heavy water secured from the Soviet Union under a contract 4 years ago. That was for the Rajasthan atomic powerplant and the contract was finalized after Canada terminated its cooperation with India in May 1976. The safeguards governing the supply of heavy water from the Soviet Union are covered under an agreement concluded between India and the International Atomic Energy Agency 3 years ago. These safeguards are said to be similar to the ones which cover the supply to the Tarapur plant under the agreement signed by India, the United States and the International Atomic Energy Agency 9 years ago. [Text] [BK141636 Delhi Domestic Service in English 1530 GMT 14 May 80]

NO CANADIAN CANDU FOR JAPAN--Tokyo, May 16 KYODO--James Donnelly, president of Atomic Energy of Canada Ltd., urged the government Friday to import Canadian-produced Candu nuclear reactor that Japan's Atomic Energy Commission has declined to install for electric power plants in Japan. Donnelly made the request when he met Yuji Osada, director general of the Science and Technology Agency. Osada, who is also chairman of the commission, said, however, there have been no developments requiring the government to change its policy to introduce the Candu reactor at present. The issue was also taken up earlier this month when Prime Minister Masayoshi Ohira held talks with Canadian Prime Minister Pierre Trudeau during his official visit to that country. Donnelly was here en route home from attending a Japanese-Canadian businessmen's meeting held in Kyoto. [Text] [OW160539 Tokyo KYODO in English 0408 GMT 16 May 80]

JAPAN URGED TO CONTROL EXPORTS--Tokyo, May 15, KYODO--The U.S. and Britain have asked Japan to tighten the export controls on nuclear technology, including uranium-enriching equipment and components, the NIHON KEIZAI SHIMBUN reported Thursday. Quoting government sources, the economic daily said the U.S. and British governments made the request being wary of nuclear-related technology which has started flowing to the Islamic sphere, such as Pakistan, Libya and Iraq, from the West. The report said the two nuclear powers asked Japan to take more effective steps to guard secrets regarding uranium enrichment and reprocessing of used nuclear fuels, and to ban the export of U-enriching and used nuclear fuel reprocessing equipment and components. The sources said the Japanese Government intends to make it mandatory for Japanese nuclear equipment manufacturers to report to the government purchase inquiries from other countries about nuclear equipment and components that are liable to be utilized in manufacturing nuclear weapons. [Text] [OW150342 Tokyo KYODO in English 0134 GMT 15 May 80]

CSO: 5100

INTER-ASIAN AFFAIRS

PAKISTAN, PRC AGREE ON NUCLEAR TEST COLLABORATION

LD161201 Moscow PRAVDA in Russian 14 May 80 p 5

[TASS report: "Dangerous Intentions"]

[Text] Delhi, 13 May--It has been learned here that talks were also held on military issues during the visit to Beijing by President Ziaul Haq of Pakistan.

According to reports in informed circles, the Chinese leaders promised Pakistan's president to allow nuclear tests to be held on Chinese territory. And it was indicated that these tests would be held under the joint observation of Chinese and Pakistani scientists.

It is noted that military experts reached agreement on sending Pakistani Air Force officers to China to train Chinese military specialists to service the American military hardware China received recently from the United States.

As a result of the discussion, the sides reached agreement on continuing the training on Pakistani territory, with the aid of Chinese advisers and instructors, of bandit formations for sending into the Democratic Republic of Afghanistan's territory.

CSO: 5100

EEC OFFICIAL SCORES AUSTRALIA'S NUCLEAR SAFEGUARDS POLICY

Melbourne THE AGE in English 24 Apr 80 p 1

[Report from Nigel Wilson]

[Text] CANBERRA. — Australia's nuclear safeguards policy is incompatible with supplying uranium to the European nuclear industry, a senior European official said yesterday.

Mr Dieter Hammer, the leader of the Euratom section of the European Commission, said there would have to be compromise if Australia was to sell uranium to Europe.

Australia's policy is that uranium buyers must first give consent on both the transfer and reprocessing of uranium.

Thus, it is claimed, Australia would keep control of uranium right through the enrichment process and to its ultimate disposal.

Mr Hammer said yesterday this was unrealistic when upwards of 500 nuclear plants were involved in the nine European Community members, involving a variety of uranium suppliers.

He was still optimistic that an agreement between Australia and Euratom—the European nuclear agency — could be signed by early next year.

But this would involve a compromise which would satisfy the spirit of the Australian policy while acknowledging the adequacy of Europe's long-standing nuclear safeguards arrangements.

Mr Hammer was talking after an informal meeting with Australian officials to discuss progress on the new agreement.

CSO: 5100

COMPANY REPORTS PROGRESS AT ROXBY DOWNS, YEELIRRIE

Perth THE WEST AUSTRALIAN in English 29 Apr 80 p 50

[Text]

Drilling at Roxby Downs is concentrating on where, not whether, mining will start on the deposit, according to Western Mining Corporation's executive director, Mr Hugh Morgan.

He said there was no longer any question about the likelihood of the huge copper-gold-uranium province being mined.

Mr Morgan gave an outline of preparatory work at Roxby Downs to an audience of 200 senior securities industry members in Adelaide.

He said that drilling was now concentrated on the eastern limb of the ore body to find out where mining could begin.

Outlining the size of the deposit was less important.

"We know that what we have here is of a very large scale," he said. "The deposit is not rich but it is big.

"We need lots of money and people.

"But the most important thing is how we get into the act because the downside risk of such a venture is horrendous."

Mr Morgan said the definition of the ore body was getting clearer now although the geologists wanted much more information to complete their picture of the find.

"With 12 rigs working three shifts around the clock, we are getting lots of information that tells us our early predictions are coming true," he said.

The present exploration phase, which is costing up to $60 million, will last two years.

"At this stage our options for mining are wide, but the way you start a project like this is crucial.

"The bigger the size the longer the lead times.

"And as the project gets bigger the marketing and finance needs expand expotentially," he said.

As for a starting date on the mine, Mr Morgan said he could not be more specific than to say it would be in the early, mid or late 1980s.

Turning to other parts of WMC activities, Mr Morgan said a complete review of the Duchess phosphate project in Queensland would be finished by May.

He described the phosphate project started by BH South as a "90 million disaster."

YEELIRRIE

WMC's uranium project at Yeelirrie, in WA, was well under way in its first stage at a cost of $21 million.

The metallurgy of the uranium extraction had proved difficult as it was in a calcrete material and could not be reached.

Mr Morgan said that oil extraction was important to the company as it could be a good money earner with not too much lead time.

He could see success coming up in the Cooper Basin activities of WMC and was bullish about the vast unexplored Pedirka Basin in SA.

WMC's oil and gas strategy was to pick up areas near pipelines where any success could be quickly followed by a cash flow.

The company's other push into energy by way of coal in the south-east of SA and western Victoria, Mr Morgan described as still "economically significant."

CSO: 5100

MARY KATHLEEN MINE NEARS END OF OPERATIONAL LIFE

Company Chairman's Report

Melbourne THE AGE in English 22 Apr 80 p 31

[Report from Barry Flint]

[Text] The Mary Kathleen Uranium mine in Queensland had an operational life of about four years, the chairman, Mr. J. L. Liebelt, told the annual meeting yesterday. But the exact time remaining was subject to many uncertain influences.

Mr Liebelt said because the orebody was highly variable one of the biggest problems was predicting the ore and waste relationships.

Other major factors were production costs, future demand and the Australian dollar price for uranium.

Mr Liebelt warned shareholders that once the operation was closed it was extremely unlikely it could be recommissioned.

With this in mind it was imperative to make a thorough search for additional ore in the area so the plant would not be shut down.

"There are a number of known uranium deposits reasonably close to Mary Kathleen," Mr Liebelt said.

But most of these were relatively small and a high proportion were of a mineral type for which an economically viable technology had not yet been developed.

"The regional exploration effort will concentrate upon the uraninite deposits similar to the mineralisation in the Mary Kathleen orebody," Mr Liebelt said.

"We are continuing exploration within our own leases and are trying to establish joint venture arrangements with other title holders. Areas adjacent to the mine are also being closely studied."

Mr Liebelt said the uranium mining industry was now feeling the loss of the momentum in nuclear power.

And an increasing imbalance between supply and demand was likely over the next few years as new mines were brought into production.

Recently, the spot price for the relatively small quantities traded on the open market had fallen from $US43 a pound to $US35.

Mr Liebelt said all of Mary Kathleen's current production was sold under long-term contracts and would not be affected this year by the movement in the spot price.

"But market studies indicated demand, and consequently prices, would remain soft at least until the middle of the 1980s.

"These longer term trends could eventually influence our contractural prices," he said.

Last year, the profit of Mary Kathleen Uranium jumped from $707,000 to $17.3 million, but this increase was not expected to be sustained this year.

With the accumulated tax losses now fully absorbed the company would become subject to income tax. This meant the net result would be substantially lower, Mr Liebelt said.

Meanwhile, loans from the company's major shareholders were due for repayment over four years from March 1981.

It was a basic condition of these loans that no dividend would be declared until the loans were fully repaid.

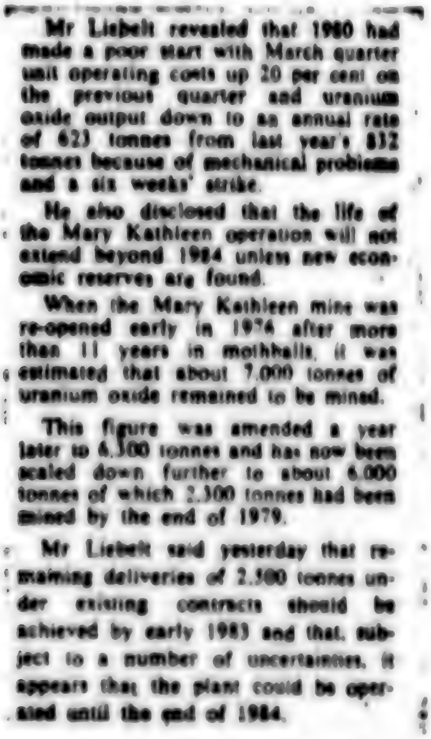
Mr Liebelt said it might be possible to repay the loans more quickly.

Further Details Given

Sydney THE SYDNEY MORNING HERALD in English 22 Apr 80 p 21

[Report by J. N. Pierce, Energy and Resources writer]

[Excerpt]



Mr Liebelt revealed that 1980 had made a poor start with March quarter unit operating costs up 20 per cent on the previous quarter and uranium oxide output down to an annual rate of 623 tonnes from last year's 832 tonnes because of mechanical problems and a six weeks' strike.

He also disclosed that the life of the Mary Kathleen operation will not extend beyond 1984 unless new economic reserves are found.

When the Mary Kathleen mine was re-opened early in 1976 after more than 11 years in mothballs, it was estimated that about 7,000 tonnes of uranium oxide remained to be mined.

This figure was amended a year later to 6,300 tonnes and has now been scaled down further to about 6,000 tonnes of which 2,300 tonnes had been mined by the end of 1979.

Mr Liebelt said yesterday that remaining deliveries of 2,500 tonnes under existing contracts should be achieved by early 1983 and that, subject to a number of uncertainties, it appears that the plant could be operated until the end of 1984.

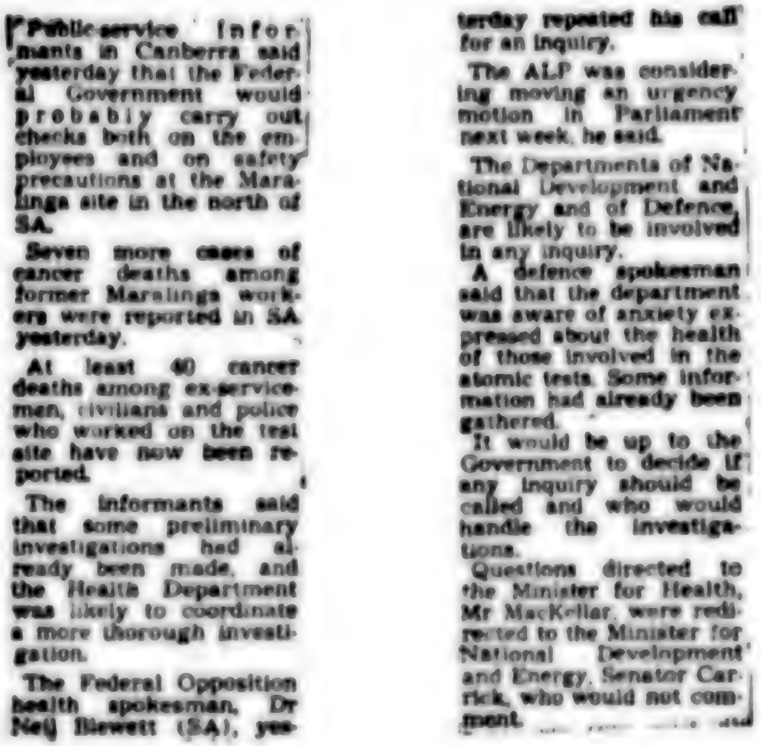
CSO: 5100

PRESS REPORTS CONCERN OVER EFFECTS OF MARALINGA TESTS

More Cancer Deaths Reported

Perth THE WEST AUSTRALIAN in English 19 Apr 80 p 8

[Text] Adelaide: An inquiry is now likely into the health of former Maralinga workers possibly affected by atomic tests in the 1950s.



Public-service informants in Canberra said yesterday that the Federal Government would probably carry out checks both on the employees and on safety precautions at the Maralinga site in the north of SA.

Seven more cases of cancer deaths among former Maralinga workers were reported in SA yesterday.

At least 40 cancer deaths among ex-servicemen, civilians and police who worked on the test site have now been reported.

The informants said that some preliminary investigations had already been made, and the Health Department was likely to coordinate a more thorough investigation.

The Federal Opposition health spokesman, Dr Neil Blewett (SA), yesterday repeated his call for an inquiry.

The ALP was considering moving an urgency motion in Parliament next week, he said.

The Departments of National Development and Energy and of Defence are likely to be involved in any inquiry.

A defence spokesman said that the department was aware of anxiety expressed about the health of those involved in the atomic tests. Some information had already been gathered.

It would be up to the Government to decide if any inquiry should be called and who would handle the investigations.

Questions directed to the Minister for Health, Mr MacKellar, were redirected to the Minister for National Development and Energy, Senator Carrick, who would not comment.

Nuclear Veterans Association

Canberra THE WEEKEND AUSTRALIAN in English 19-20 Apr 80 p 4

[Report from Elizabeth Johnston]

[Text] THE Federal Government, already under pressure from suspected Agent Orange victims, could face new compensation claims from veterans who could have been exposed to radiation during World War II and at atomic bomb tests at Maralinga in 1953 and 1954.

The inaugural committee meeting of the Australian Nuclear Veterans Association in Brisbane on Saturday will discuss a proposal to set up a register of people who could be affected.

The interim co-ordinator of the association, Mr Pat Creevey, said in Brisbane on Friday that about 4000 servicemen and women would have been involved in clean-up operations at Hiroshima and Nagasaki, and another 2000 at the Maralinga atomic bomb test site in Australia.

"We don't want to get hysterical about this and it may turn out that a statistical survey will show that the occurrence of cancer is no greater in this group than in the general community," Mr Creevey said.

'NO PROTECTION

"But we do know that blokes flew planes through the clouds at Maralinga without wearing protective clothing, that they flew home in contaminated aircraft and they took radioactive clothing home for their wives to wash.

"All those who were in Japan say flatly they were given no protective gear at all, no masks and no checks."

The association has set up branches in NSW, Victoria, South Australia, Western Australia and Queensland.

Danger to Aborigines

Melbourne THE AGE in English 22 Apr 80 p 16

[Text] PERTH. — ASIO agents told an ex-serviceman to keep quiet about claims that Aborigines were walking freely through radioactive dust at Maralinga, South Australia's former atomic testing site.

Patrick Connolly, 36, who was an RAF corporal at the site from 1962 to 1964, claimed yesterday this would result in "the Australian Hiroshima".

He knew two former servicemen in Perth who were suffering radiation-associated diseases.

"But the major tragedy is going to be among the Aboriginal people. I believe we are going to see a catastrophe which will be the Australian Hiroshima. It is going to be mass genocide," he said.

"Hundreds of Aborigines walked through the supposedly restricted area and camped in the radioactive dust. Sometimes they were covered in it. Goodness knows how they are going to be affected or how they are suffering now."

Mr Connolly, now a Perth businessman, said four other former servicemen from Maralinga now living in Perth had also been advised to keep quiet.

Last year he was among Maralinga veterans who visited Britain for talks with other former servicemen who had worked on the site.

The British veterans, who had formed a Maralinga society, said security agents had also warned them not to talk.

"There is an attempt to hush up the results of Maralinga but a lot is going to come out in the next few years," he said.

A Perth Maralinga society is expected to be formed in a month, so members could speak-up without feeling quite so intimidated.

CSO: 5100

ELECTRICIANS UNION TELLS MEMBERS TO LEAVE URANIUM MINES

Brisbane THE COURIER-MAIL in English 19 Apr 80 p 1

[Text] The Electrical Trades Union yesterday warned members at uranium mine sites to leave or face possible union expulsion.

The union also is withdrawing from the Mary Kathleen Uranium Limited industrial agreement.

It has joined other unions to ban equipment for uranium mines, in a campaign to enforce the Australian Council of Trade Unions uranium policy.

Workers at two Brisbane metal shops already have banned work on equipment for the Ranger mine in the Northern Territory.

The ACTU senior vice president, Mr Cliff Dolan, told Trades and Labor Council affiliated union delegates on Thursday night that uranium mining, processing and export could be halted.

But effective union action was likely to take place away from the mine sites, he said.

Unions in such areas as the manufacture and handling of mine materials and machinery could halt uranium production.

Mary Kathleen — Australia's only uranium exporting operation — made a $17,360,000 profit last year.

Mr Dolan, the Electrical Trades Union national secretary, played a vital role when the ACTU congress reaffirmed its opposition to uranium mining last September.

Mr Dolan said: "The ETU national executive recently gave members 21 days to withdraw from mine sites.

"If they don't, they will not be regarded as union members and action will be taken to expel them if necessary."

The union is already refusing service to members working at the mines.

"We are not taking part in any negotiations on their behalf," said Mr Dolan.

"They are in breach of union policy."

State organiser, Mr Ray Dempsey, said last night the union would not renew the Mary Kathleen agreement due now.

"We may have a lot of angry electricians," he said.

Members at the mines included electricians and their offsiders, instrument fitters and linemen.

Mr Dempsey said the union did not cover many workers, but the move could lead to a "No union shop" situation at the mines.

"Employers will find it more difficult to attract workers to these areas," he said.

"It could mean they might have to run the mines with steam shovels.

"They may need 10,000 workers to dig ore with picks and shovels."

Mr Dempsey said the stand would not force all members to leave the mines.

Other ACTU affiliated unions could cover the stayers if they wanted to sacrifice their principles.

But the mine companies would face serious problems in 18 months without ETU expertise to handle problems arising with former members.

The campaign against uranium would be most effective in the supportive areas.

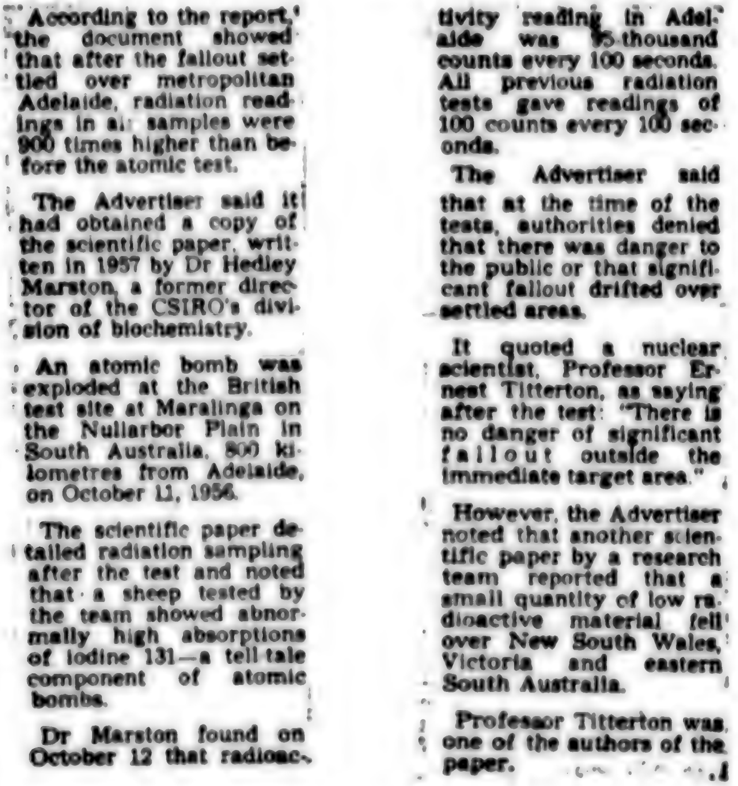
"We warn electrical contractors not to go to the mines to instal equipment or they will be buying industrial strife," he said.

CSO: 5100

CLASSIFIED REPORT REVEALS 1956 FALLOUT OVER ADELAIDE

Perth THE WEST AUSTRALIAN in English 18 Apr 80 p 23

[Text] Adelaide: A classified scientific report revealed that radioactive fallout from an atomic-bomb test drifted over south-eastern Australia in 1956, according to a report in yesterday's Adelaide Advertiser.



According to the report, the document showed that after the fallout settled over metropolitan Adelaide, radiation readings in air samples were 900 times higher than before the atomic test.

The Advertiser said it had obtained a copy of the scientific paper, written in 1957 by Dr Hedley Marston, a former director of the CSIRO's division of biochemistry.

An atomic bomb was exploded at the British test site at Maralinga on the Nullarbor Plain in South Australia, 800 kilometres from Adelaide, on October 11, 1956.

The scientific paper detailed radiation sampling after the test and noted that a sheep tested by the team showed abnormally high absorptions of iodine 131—a tell-tale component of atomic bombs.

Dr Marston found on October 12 that radioactivity reading in Adelaide was 95 thousand counts every 100 seconds. All previous radiation tests gave readings of 100 counts every 100 seconds.

The Advertiser said that at the time of the tests, authorities denied that there was danger to the public or that significant fallout drifted over settled areas.

It quoted a nuclear scientist, Professor Ernest Titterton, as saying after the test: "There is no danger of significant fallout outside the immediate target area."

However, the Advertiser noted that another scientific paper by a research team reported that a small quantity of low radioactive material fell over New South Wales, Victoria and eastern South Australia.

Professor Titterton was one of the authors of the paper.

CSO: 5100

AUSTRALIA

BRIEFS

NUCLEAR TESTS PROTESTED--Sydney City Council has bluntly rejected an offer to participate in the 1980 Biennale de Paris, and has taken the opportunity to attack the French for testing nuclear weapons in the Pacific. The council on Monday voted to tell the organisers of the Parisian cultural festival that the best way to improve relations between France and Australia was to "immediately desist from exploding and testing nuclear devices in the Pacific Ocean." Civic Refrom aldermen opposed the move to snub the Biennale, claiming that the council had no right to interfere in foreign affairs, but Labor won the vote with the support of the newly-declared independent member of the council, Alderman Charles Boag. [Excerpts] [Sydney THE SYDNEY MORNING HERALD in English 30 Apr 80 p 3]

RANGER WORKERS STRIKE--About 500 workers building the Ranger uranium mine in the Northern Territory have gone on strike for a bigger site allowance. The federal secretary of the Miscellaneous Workers' Union, Mr Ray Gietzelt, said in Sydney yesterday that the employees, who were awarded a $1-an-hour site allowance a year ago, had made an ambit claim for a $10-an-hour allowance. The Miscellaneous Workers' Union covers construction workers and truck drivers associated with the uranium industry in the Northern Territory. [Excerpts] [Sydney THE SYDNEY MORNING HERALD in English 24 Apr 80 p 9]

WEST AUSTRALIAN POWER NEEDS--It was highly unlikely that nuclear power would be needed in WA, the Opposition spokesman on fuel and energy, Mr T. H. Jones (Collie) said yesterday. This was apparent in the light of comments made last week by the State Energy Commission's assistant commissioner (engineering) Dr R. R. Booth. Dr Booth had said that Collie coal would be used for electricity generation in WA as long as it was available, though WA was committed to be prepared for nuclear power if it was needed. Mr Jones aid that proven extractable reserves of coal at Collie were enough to meet projected needs for at least 50 years. "The Government should drop its mindless obsession with nuclear power and get on with developing fully the nonnuclear energy resources we have had for many years." [Excerpts] [Perth THE WEST AUSTRALIAN in English 17 Apr 80 p 16]

CSO: 5100

DELHI CARRIES COMMENTARY ON CARTER NUCLEAR FUEL DECISION

BK100242 Delhi Domestic Service in English 1545 GMT 9 May 80

[Commentary by L.K. Sharma, special correspondent of the TIMES OF INDIA]

[Text] India's Tarapur nuclear powerplant, starved of fuel for the past 2 years, can look forward to better days. President Carter's intervention should insure that the first of the two pending consignments of 16.8 tons each of enriched uranium reaches Tarapur before winter. Mr Carter's decision to authorize fuel supplies reflects some willingness of the United States to see reason. India's plea all through the long delay that exposed our nuclear power program to grave danger has been that the U.S. should meet its contractual obligation and maintain regular supplies. Whatever be the decision by the NRC [Nuclear Regulatory Commission], Mr Carter will issue an executive order authorizing the first consignment. The presidential decision can then be vetoed only by a two-thirds majority of the U.S. Congress. One hopes that this major initiative taken by President Carter will not be frustrated.

The U.S. President's decision has come as a surprise since India did not make any compromising gesture despite consistent pressure from the United States that India should accept full scope safeguards for all its nuclear facilities. In fact, as was expected, the new government of Mrs Gandhi ended all ambivalence about India's stand and went so far as to declare that, if necessary, peaceful nuclear explosions would be resumed. Lest patience be mistaken as weakness, India also made it clear that failure of assured fuel supplies for Tarapur would compel India to free itself from other clauses of the contract and to pull the Tarapur station out of safeguards.

A corollary to the breach of contract by the United States would have been an open option for India to get fuel supplies from other sources and to reprocess the fuel used at Tarapur which has been piling up because of the U.S. indecision. President Carter's decision to expedite fuel supplies to India shows a fresh thinking in the U.S. administration on problems of nuclear nonproliferation. Not only did the U.S. spokesman announce the presidential decision to authorise the first consignment, he also said that the government was recommending to the NRC to consider the application for the second consignment favorably. He also hinted that India could go ahead and ask for more, though earlier this seemed futile under the new legislation. Of course, no radical policy changes can be expected when the presidential election campaign is in full swing.

In the context of India-American ties, even the slight shift removes a major irritant in the bilateral relations. The policy shift may, however, gain greater significance in the context of the growing worldwide criticism of the ambiguous nuclear morality preached by the United States. At the recent conference of the International Atomic Energy Agency, developing as well as developed countries raised the issue of assured fuel supplies in a big way. It was clear that even the countries which had accepted full scope safeguards, which India considers discriminatory, were finding it hard to acquire the contracted supplies of nuclear equipment and fuel.

The indignation of the receiver countries apart, it has become progressively clear that the United States finds it difficult to impose its will on its friends and allies who are not prepared to follow the path of nuclear renunciation to the limited extent of shutting off the supplies for the nuclear have nots. Then came the final report of the international nuclear fuel cycle evaluation, a study organized on the U.S. initiative. It knocked down the very basis of the U.S. premise that breeder reactors would substantially add tothe danger of proliferation. This has strengthened the position of the European countries who are also dependent on the U.S. shipments of nuclear fuel.

Mr Carter's decision, if it leads to the supply of the two pending consignments of fuel for Tarapur, can only provide a breather for the atomic energy department which will still have to find some way of getting guaranteed fuel supplies. The two consignments will see the plant through 2 years of its operation. If the power generation is suppressed, as is being done now, these 2 years could be stretched to three. This period is more than adequate for the department to come up with the alternative mixed oxide fuel since considerable work on it has already been done. That alone will free Tarapur from its dependence on foreign sources of supplies.

India is considering whether it should go in for a uranium enrichment facility. Such a plant was proposed initially, but on cost considerations it could not be undertaken. Tarapur is the only plant which requires enriched uranium since all others are based on natural uranium. In fact, Tarapur did not fit into the general route of the atomic power development program that was chalked out under the leadership of Dr Homi Bhabha. Dr Bhabha had agreed to have this turnkey project only with a view to demonstrating the benefits of nuclear power. Its running, of course, has given useful experience to Indian engineers. The route that Bhabha chose still remains valid. It planned for the use of the existing limited quantity of natural uranium to install thermal reactors of the heavy water type. In the second stage the plutonium produced in these will be used to feed fast breeder reactors which will in turn use the depleted uranium acquired from the fuel discharged from the heavy water reactors and thorium of which we have vast reserves. This seems to be the most efficient use of the indigenously available fuel.

Troubles of Tarapur apart, the development of the first stage powerplant could not progress as per schedule. Today we are able to build a nuclear power reactor with import contents being as low as 15 percent. The path of self-reliance does not run smooth and a price has to be paid in terms of costs and time (?overruns). The setback can be attributed to other reasons such as delayed decisions [word indistinct] by foreign suppliers and the withdrawal of foreign assistance following the peaceful nuclear explosion.

The cumulative result is that the share of nuclear power in the total generation has marginally come down over the years and now is just about two percent. In fact, the total installed capacity of nuclear powerplants is 600 megawatts, just one-fifth of the original target. Beside two units of Tarapur, only one unit of the Rajasthan project is operating today.

The nonavailability of heavy water has delayed the commissioning of the second unit of the Rajasthan project. Tarapur's hand to mouth or rather [word indistinct] to reactor existence ought to have driven a lesson home. India cannot afford to slacken its efforts for gaining self-reliance in this sophisticated field. An assurance about another consignment of fuel should not lead to complacency. The effort in the nuclear field must be stepped up to maintain the early lead in this field that India had acquired among the developing countries. In the context of the present energy crisis, India cannot afford the stagnation in the growth of nuclear power.

CSO: 5100

URANIUM, THORIUM DEPOSITS FOUND IN TIMOR

Governor Delivers Sample

Jakarta SINAR HARAPAN in Indonesian 15 Apr 80 p 3

[Excerpts] Kupang, 14 April--A quantity of radioactive material has been found in Oi Suhu village, Oe Sao sub-district, Kupang Timur. A sample of the substance amounting to 1-1/2 kg, with a security package weighing 25 kg, has been brought by the Governor himself, Ben Mboi, and presented to President Soeharto and the National Atomic Energy Body last Saturday [12 April] in Jakarta.

Governor Ben Mboi further declared that before he left Jakarta on Sunday morning [13 April] information had been obtained from the BATAN [National Atomic Energy Body] laboratory that the material which he brought from Kupang contained radioactive substances.

He said that the materials registered the highest radioactive level by comparison with what had previously been found elsewhere in Indonesia. It was 20 percent higher than what had been discovered previously. According to Ben Mboi, when he met with the chief of state on Saturday [12 April], up to the present time a total of three areas have been found in Indonesia which contain radioactive substances, respectively, Kalimantan, the southern part of East Java, and most recently in East Nusa Tenggara.

A SINAR HARAPAN source states that the material containing the radioactive substance was initially discovered by the local people. Previously, the area concerned was regarded as sacred. Water coming from it or flowing through it, if drunk by the local inhabitants, caused them to have a stomachache, to vomit, and to feel dizzy.

Kastillio, the Director of PT Flobabora, which was engaged in the mining and industrial sector in the area, was interested in the story told by the people. Later, he began to carry out an investigation of it in 1971.

With a Geiger Counter (instrument which registeres radioactivity) it turned out that stagnant rain water and objects found in the area caused the instrument to register and indicated the figure of 250 on the Geiger scale.

In the bare mountains near the area there were red, brown, purple, green and yellow-white lines found. On the slopes of the mountains were scattered seed-like objects as big as corn seed which glittered. Also found was a heap of earth at the cone of the mountain which seemed to have been pushed up by an eruption from below ground. On top of the heap of earth there was a group of mineral fragments in the form of thin, black, flat pieces which stuck to each other. According to the source the area which was inspected was about one square km in extent, and in that area the radioactive level was 275 on the Geiger Counter scale.

The materials containing the radioactive substance are believed to contain uranium, a composite of uranium 238, 235 and 234.

Survey by BATAN Team

Jakarta KOMPAS in Indonesian 15 Apr 80 pp 1, 6

[Excerpts] A more detailed investigation of radioactive mineral deposits in Oe Suu village, about 36 km east of Kupang, will be carried out shortly by a team of BATAN experts from Bandung. The team will arrive today [15 April] and begin its investigation tomorrow [16 April].

The investigation follows the report of the Governor of East Nusa Tenggara, Ben Mboi, last Saturday [12 April], to President Soeharto at the Bina Graha offices concerning the discovery of a mineral deposit which contains the discovery of a mineral deposit which contains the radioactive elements uranium and thorium.

Last Friday [11 April] the Governor brought samples of mineral rocks containing radioactive substances, in the form of azurite, malachite, a flat, black mineral, other stones, and a quantity of red earth from the opening in the bare surface where the minerals were found.

According to Ben Mboi, the sample materials which he reported on to the President, together with a topographical sketch, were given a preliminary examination by the BATAN team in Jakarta last Saturday [12 April], and it was stated that the deposit contains radioactive uranium and thorium.

In his statement to KOMPAS before departing for Jakarta last Thursday [10 April] Ben Mboi stated that the radioactive mineral deposit was discovered by accident by a practical geologist, C. Castilio, who is the Director of PT Pertambangan Floba Mora, in Kupang. In 1972, when Castilio was carrying out a survey in the course of mining in the area for minerals such as raw materials for a cement factory, the people of Oe Suu village reported that there was a haunted mountain which frightened them. The mountain was called "Bukit Setan" [Devil's Mountain] because every person who went there always encountered some trouble, like not being well and being sick.

Castilio stated to KOMPAS that the Geiger Counter registered radioactivity from elements of uranium and thorium with the numbers of 234, 235 and 238, with 275 showing on the Geiger Counter scale. This means that the radioactivity is much stronger than that found in Kalimantan, which registered 100 on the Geiger Counter. He said that the area with the radioactive deposit registering 275 was about 1.5 km in area. At a radius of 2.0 km the Geiger Counter was still picking up the signs of radioactivity.

According to Castilio, apart from Timor, uranium and thorium has also been found in the village of Lamanaging, East Flores. However, it only registered 7.0 on the Geiger Counter.

5170
CSO: 5100

BRIEFS

FUKUI REACTOR REOPENS--Fukui, May 15, KYODO--Full-scale operation of the new type nuclear power reactor "Fugen" reopened at 4 p.m. Thursday in Tsuruga, Fukui Prefecture. The Fugen reactor of the Power Reactor and Nuclear Fuel Development Corp. of Japan passed Thursday the final examination of the government before the reopening. No abnormality was discovered in the periodical examination of the nuclear reactor itself, fuel exchanger, and other parts of the Fugen, corporation officials said. The first periodical check on the reactor began February 1. Since April 24, it has been in adjusting operations, last step of the periodical examination, they added. [Text] [OW150859 Tokyo KYODO in English 0855 GMT 15 May 80]

REACTOR SHUTS DOWN--Fukushima, May 16, KYODO--A light water-cooled reactor at Tokyo Electric Power Co's. No. 1 nuclear power station, southeast of here, came to an automatic halt Thursday night due to malfunctioning of a hydraulic pressure gauge controlling the steam generated by the reactor. There was no radiation leak. The 1.1 million-kilowatt capacity generator stopped when the gauge signaled a decline in the oil pressure. The malfunction of the No. 6 reactor was its first since it was put into commercial operation last October. Three of the six reactors at the facility are currently undergoing periodic checks. [Text] [OW160655 Tokyo KYODO in English 0644 GMT 16 May 80]

CSO: 5100

BRIEFS

INDIA SUPPORTS ATOMIC ENERGY--Lahore, 14 April--Sardar Swaran Singh, special ambassador of India's prime minister, said in Lahore today that India supports the peaceful use of atomic power, and takes the position that all countries have a right to procure atomic energy. He was talking with newspapermen on his arrival in Lahore this morning from Rawalpindi. He conferred with Undersecretary of Foreign Affairs Agha Shali to discuss the situation in this area and met with the President. He left for Delhi after half an hour's stay in Lahore. He visited Gurdwara Dera Sahab and Ranjit Singh's Tomb while he was at the state capital. He also visited the Badshahi Masjid and the Shahi Qila and ate lunch with the former finance minister, Mr Amjad Ali. At the airport, Mr Swaran Singh was asked as to why India opposed Pakistan's effort to procure a processing plant even though India already has atomic plants. He replied that India is in favor of all countries having atomic energy for peaceful purpose and that India was giving attention to the peaceful use of atomic energy. When the fact that India was opposing Pakistan's efforts to acquire a reprocessing plant was brought to his attention, he said that Pakistan can go ahead and acquire a reprocessing plant and that nobody was going to stop it. [Text] [Quetta JANG in Urdu 15 Apr 80 p 1] 7997

INDIAN OPPOSITION LEADER'S VIEWS--Karachi, 14 April--Dr Subramanium Swami, India's top political scientist and opposition leader, said that the officers of the armed forces of India and Pakistan should have a meeting to discuss the new developments in southern Asia. In this way, they can discuss the problems and find ways beneficial to both countries. According to a report in the EVENING STAR, Dr Swami said that the officers of the armed forces of both countries should meet without any political interference from either country. Such a meeting would foster goodwill and be beneficial to both countries. He said that President Zia-ul-Haq is a man of his word who is respected by Morarji Desai. The relationship between the two countries improved during the Desai rule. Referring to arms aid to Pakistan, Dr Swami said that "the Indian government should give due consideration to this issue. Pakistan's acquisition of nuclear arms would not affect [it] in any way. China and Russia also have these weapons, and the United States, which has all types of weapons, is very much present in this area. I am sure that President Zia's statement about his atomic program being for peaceful purpose is based on truth." [Text] [Quetta JANG in Urdu 15 Apr 80 p 6] 7997

ATOMIC SELF-RELIANCE URGED--Islamabad, 15 April--Chairman of the Pakistani Atomic Energy Commission Munir Ahmed Khan said that the import of technology to third world countries is neither easy nor cheap. We have to depend on our own resources, he said. He further said that Pakistanis have to solidify their educational and administrative systems. Emphasizing better training of professionals and the labor force, he said that Pakistanis will have to work very hard for many years. He said: "There is no shortcut provided by nature if we want such a revolutionary change here. Instead, we have to work a lot in a very little time in order to make our country industrialized." In a radio interview to be aired tonight, he emphasized the role of technology in the progress of third world countries. He said: "Though the advanced countries claim to be ready to help with atomic technology if we sign pacts restricting the use of nuclear arms, in reality it does not happen. The countries which have signed the pacts restricting the flow of atomic armaments have not been provided with any nuclear technological aid." He said that the advanced countries have formulated rules of their own so as to make the poorer countries' access to nuclear technology impossible. [Text] [Quetta JANG in Urdu 16 Apr 80 pp 1, 6] 7997

CSO: 5100

BRIEFS

RADIOACTIVE WASTE STORAGE--According to Cheng Chen-hua, secretary general of the Atomic Energy Commission of the Executive Yuan, NT $1 billion will be used to build a storage facility for radioactive materials to be disposed of in the (Lungmen) area on Lanyu Island, Taitung County. The facility will be completed for use in August this year. [Taipei Domestic Service in Mandarin 1200 GMT 3 May 80 OW]

CSO: 5100

HUNGARIAN PATENT FOR DISPOSAL OF RADIOACTIVE WASTE

Budapest MAGYAR NEMZET in Hungarian 16 May 80 p 9

[Excerpts] Disposal of liquid and solid radioactive waste from nuclear power plants in a secure manner is a problem throughout the world. So far not even the West has succeeded in evolving a satisfactory technology although a number of processes are known. Hungarian researchers have succeeded in evolving, after 10 years of experimentation, a method which has numerous advantages over those now used and is more modern than the latter in many respects. Colleagues of EROTERV [Electric Power Plant Designing Enterprise] and of the Isotope Institute of the Academy Laszlo Liptak, Gyula Lovass, Karoly Szivos as well as Jozsef Hirling and Oszkar Pavlik worked out the so-called sub-boiling point evaporating and cementing technology.

The new method requires liquid wastes to be condensed in an evaporating device; their volume is reduced, then the thickened mass is embedded in concrete and buried. The principle advantage of the new procedure is that the volume of the solid end product which is embedded in concrete is only 40 percent of that of liquid waste so that a far smaller area is required for burying radioactive waste than in other procedures. If we use the waste produced by the Paks Nuclear Power Plant now under construction as an example, 500 cubic meters of solids would remain of the approximately 1,200 cubic meters of liquid waste generated by the four blocks of the Plant annually. An area of about 10 hectares would be required to bury the liquid waste produced by a plant of the size of Paks. Not only is the process of purification extremely ingenious, but the method for transporting it as well. The "treated" waste is shipped to the disposal area in so-called fluidizing, secure containers. Generally, thick-walled steel containers are used for this purpose. According to the Hungarian system, sand which can be brought into quasi liquid state when the container is raised or sunk provides the shielding from radioactivity. Because of the layer of sand, the container has outstanding resistance to dynamic and heat effects; thus it prevents container damage for a very long time in case of accident.

So far the Hungarian patent has been registered in nine countries, and several countries are interested in purchasing it. It is worth noting that General Electric, which is concerned with nuclear power plants, stated in a response to an inquiry from Paks that the sub-boiling point evaporating system evolved at Paks is the most effective and suitable system of all systems known to them. This opinion plus the international interest already manifested leads to the conclusion that this process may satisfy the world market and become the source of substantial amounts of foreign exchange.

Among the advantages of the process are its flexibility, its adaptability to various prevailing climates. In humid countries, security can be enhanced by increasing the amount of concrete; under desert conditions, completely dry condensation is possible. Incidentally, the American firm volunteered to act as prime contractor for implementation of the system. This is most unlikely to happen, because EROTERV and Vegygepszer [Chemical Works Constructing and Fitting Enterprise] have concluded an association agreement for the industrial realization of the invention. As prime contractor, Vegyepszer will undertake to organize and realize the complex system. The enterprise will do everything from inviting bids, planning and implementation to putting the system into operation.

The contract for constructing facilities and installations for treating radioactive wastes was signed between Vegyepszer and EROTERV on 15 May at the Isotope Institute of the Hungarian Academy of Sciences. State Secretary of Heavy Industry Adam Juhasz was present at the ceremony.

CSO: 5100

POLAND

ARMY PAPER SCORES PAKISTANI ATOMIC BOMB, WESTERN REACTION

LD030915 Warsaw PAP in English 0514 GMT 3 May 80

[From the press review on U.S.-Pakistani relations]

[Text] PAP, Warsaw, 3 May--The Polish Army daily ZOLNIERZ WOLNOSCI wrote in an article entitled "The Pakistani A Bomb":

"When the news about the Pakistani atom bomb started appearing in the press the West dissociated itself immediately from the nuclear plans of 'insidious' Islamabad. In spring last year the U.S. even announced the discontinuation of military assistance to this country. However, anger gave fast way to goodwill when Pakistan became a base for Afghan counter-revolutionaries supported by international reactionary forces. The U.S. 'regional' interests and of their allies got the upper hand over a global threat connected with the proliferation of nuclear weapons.

"Washington started virtually to impose military assistance upon Islamabad. The FRG and many other NATO member countries promised financial assistance. France agreed to sell Pakistan an additional squadron of fighters and other military equipment. Also Beijing has shown clear activeness in this respect", said the daily.

"When will the Pakistani atom bomb explode? Will it be in half a year or a year and a half time? Experts give different opinions but all agree with respect to one thing that the Pakistani nuclear bomb is almost ready."

CSO: 5100

BRAZIL, ARGENTINA STRENGTHENING OF RELATIONS

Castro Madero Queried

PY121921 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 8 May 80 p 7

[Undated exclusive interview granted by Rear Adm Carlos Castro Madero, chairman of the Argentine Atomic Energy Commission, to O ESTADO DE SAO PAULO special correspondents Marcos Wilson and Celso Ming in Buenos Aires]

[Text] [Question] What is the status of the Brazilian-Argentine negotiations on a nuclear agreement?

[Answer] Our two countries have drafted a basic agreement and have reached a consensus on the agreements that will be signed by the Brazilian Nuclear Corporation [NUCLEBRAS] and the Argentine National Atomic Energy Commission [CNEA].

[Question] Can you give us a preview of the most important points of these agreements?

[Answer] In a very general way. We have established the foundations for cooperation in basic research and in the exchange of information on protection against radiation [radiolica], on nuclear energy and on the nuclear data center.

[Question] Will there be an agreement regarding uranium prospecting?

[Answer] We will have an agreement with NUCLEBRAS for the exchange of information and technology in the field of uranium prospecting. There will most probably be an agreement regarding the supplying of equipment on a reciprocal basis, and NUCLEBRAS Heavy Equipment, Inc, [NUCLEP] could manufacture component parts for Argentina.

[Question] What type of component parts?

[Answer] The large components that are manufactured by NUCLEP. Therefore, we must make a decision; it is a complex contract because these are components that Argentina cannot manufacture and that we would have to seek in Germany. Argentina could supply the tubes for the fuel. Brazil has no intention of building a factory for the manufacture of these tubes. There is also the possibility that Argentina will loan natural uranium to Brazil. These are the ideas we are discussing.

[Question] Has the "Pescarmona" [not further identified] plant decided what type of equipment it is going to produce?

[Answer] No, no, this has not yet been fully decided, although nearly so. We are discussing with the Kraftwerks Union [KWU] firm the equipment that will be manufactured by Pescarmona so that it will be guaranteed by the German firm. Regarding the guarantee and the timetable, we are in the final stages of coming to a decision with KWU regarding national participation in the manufacture of large components.

[Question] What position will the FRG take with regard to the unification of the Argentine and Brazilian equipment markets, and, consequently, how much of an increase will there be in the bargaining power of the two countries?

[Answer] Will there be a unification of markets between the two countries? We are not going to negotiate jointly. Germany and Brazil created a series of enterprises; in other words, Germany participates in a series of enterprises with an established number of shares. Argentina is only going to form one joint engineering enterprise with Germany. That country will have no participation in the rest of Argentina's nuclear industry. Germany and Argentina will be partners only in this engineering enterprise, which will be responsible for implementing the project. And in addition, the Germans will supply components and services.

[Question] Will there be no unification in the negotiations with Germany?

[Answer] No, no, there will be no unification in the negotiations. Therefore, complementation is interesting because it will allow Brazil and Argentina to share experiences regarding the implementation and development of their respective projects. This does not mean a unification of the market with regard to Germany.

[Question] How is the agreement with Switzerland regarding the manufacture of heavy water working out?

[Answer] Very well. The CNEA has signed contracts with the Swiss firm Sulze, and we have begun the engineering work. We hope to begin construction this year.

[Question] To what extent will Argentina and Brazil be vulnerable to the pressures of the United States and the other members of the nuclear club when they sign a cooperation agreement?

[Answer] I believe that the agreement will help eliminate the excuses that are given to prevent the transfer of technology or to keep the two countries from becoming self-sufficient. The fact that Brazil and Argentina--countries which other nations believe to be rivals--should cooperate and open their installations to one another proves that there are no hidden intentions to build nuclear weapons. This should also help to overcome the distrust of more developed countries toward the objectives of our nations. There have been no U.S. pressures. On the contrary, the Argentine-Brazilian rapprochement was greeted with great satisfaction.

[Question] Is it possible that Argentina will help Brazil change its system for the production of nuclear energy?

[Answer] Not at all. I do not believe that this system can be changed because the two countries are fully engaged in developing their systems, and a change would be totally negative, especially in terms of cost.

[Question] Is the Argentine system more advantageous?

[Answer] For Argentina its system is the best, and for Brazil its system is the most appropriate. Each system is adjusted to the country's objectives and to the time in which the country plans to attain them. We Argentines are very happy because we have eliminated the slow and expensive enrichment process, and this allows us to control the entire fuel cycle. Brazil has solved its problem by purchasing enrichment technology from the FRG. The two nations have overcome the problems which hindered self-sufficiency.

[Question] The agreement provides for an exchange of technology. Does this mean that Argentina will transfer its natural uranium technology to Brazil and the latter its enriched uranium technology to Argentina?

[Answer] I would not say the entire technology, because I believe that Brazil has restrictions stemming from the secret nature of the information supplied by the KWU. At the same time Argentina has restrictions regarding the technology received from Canada. I believe that Brazil and Argentina are free to share practical experience.

[Question] Did you have access to the nuclear contract between Brazil and the FRG?

[Answer] No. Our negotiations with the FRG resulted from the difficulties we were experiencing with Canada. Thus we sought another supplier to end our dependence on a single supplier. This is what moved us to view the FRG as a second supplier to create up-to-then nonexistent competition in the field of natural uranium. Brazil did not influence Argentina at all.

[Question] Some experts say that the Brazilian and Argentine technologies are obsolete. What is your opinion?

[Answer] I do not agree with this view because reactor technology is in constant development, incorporating technical improvements all the time. It would be very rash to say that fast breeder reactors will soon take the place of thermal reactors. Fast breeders will go into operation at the end of the eighties. The countries which should at this point choose to build these reactors will have to make a great effort to create the necessary services and facilities to develop this type of reactor. Argentina still has a long way to go working with thermal reactors before it can tackle fast breeders. This would also depend on the success of these reactors in Europe. It is more probable that Argentina will first try a thermal breeder, like the ones which use the thorium cycle.

[Question] Will the Brazilian-Argentine nuclear agreement be signed by the two presidents?

[Answer] There will be a statement on nuclear issues among the accords which Presidents Jorge Videla and Joao Figueredo will sign. However, I do not know the contents and the details of this statement.

[Question] What, in your opinion, are the prospects for producing nuclear energy through fission [fissao]?

[Answer] It is believed that controlled nuclear fission will be attained in the nineties. This means that a prototype reactor will be built by the end of the century and commercial reactors will begin operating around 2020. These are the prospects, more or less. The technology which will have to be used will have to be highly developed, and the material to be used will have to be of a very superior quality. Therefore, the costs will be very high.

[Question] What are the costs of energy production in Argentina?

[Answer] The most economical plants are generating energy at $0.023 per kw/hour. The Chocon hydroelectirc plant, which is the main hydroelectric plant, produces energy at $0.002 or $0.003 more than that figure. The thermal plants are producing energy at a cost $0.040 per kw/hour.

[Question] Are the fears that Argentina and Brazil are heading toward the production of nuclear weapons baseless?

[Answer] Totally baseless, because both Argentina and Brazil have repeatedly stated at all international forums that they are interested only in the peaceful use of nuclear technology. Again and again, the governments of the two countries have expressed their peaceful intentions. In addition to this, the attempt by any country to develop a nuclear bomb is easy to detect. Modern means of information which the great power possesses would swiftly detect and disseminate the information about any such attempt. Thus, we can say with absolute certainty that the fears to which you refer are absolutely baseless.

[Question] What are the main difficulties Argentina and Brazil are having with the developed countries?

[Answer] The difficulties which Argentina is having are in the field of the so-called sensitive technologies, that is, the reprocessing and enrichment of uranium. These two processes are very important and necessary for every fuel cycle, and the industrialized countries are not prepared to share their knowledge. Brazil has avoided this problem through its accord with the KWU [Kraftwecks Union]. Therefore, I believe that for the time being Brazil does not have any problems because it is sharing knowledge with the FRG which is one of the most advanced countries in the world. The situation is more difficult for Argentina because it does not have this kind of partner in developing its fuel cycle, since it has chosen to do everything by itself. Thus, it must pay for its independence.

[Question] Can Brazil and Argentina overcome these problems jointly?

[Answer] I believe that for the time being our two countries need foreign aid for their development, and this will prevent us from solving these problems by ourselves. At a later date the progress of our countries, our own progress, will free us from the need to resort to industrialized nations.

[Question] What is your position toward the utilization of nuclear devices for exclusively peaceful purposes?

[Answer] In some cases peaceful explosions seem to be obvious means for the construction of channels for navigation and for a more effective exploitation of lenticular oil and gas deposits into a single one. However, the experiments which have taken place in the United States do not seem to have yielded very favorable results. Therefore, this technique has remained something that is yet to be developed. Latin American countries should not give up the possibility of using atomic explosions for peaceful purposes as has been expressly stated in the Tlaltelolco Treaty, especially when these explosions are economically justified. Obviously, these explosions must take place under the supervision of international organizations.

Ten Agreements Signed

PY171610 Buenos Aires TELAM in Spanish 1?30 GMT 17 May 80

[Excerpts] Buenos Aires, 17 May (TELAM)--The Argentine and Brazilian foreign ministers, Carlos Washington Pastor and Ramiro Saraiva Guerreiro, respectively, today signed 10 documents, including agreements, treaties and notes aimed at strengthening relations between the 2 countries.

The first document is the cooperation agreement for the development and application of nuclear energy for peaceful uses. This document gives authority to the Argentine National Atomic Energy Commission (CNEA) to sign agreements with the appropriate Brazilian organizations in the nuclear field and will be put into operation through an exchange of diplomatic notes.

It was also established that the two governments will consult each other to coordinate their positions at the international level when necessary.

Notes were also signed implementing the cooperation agreements signed today between the CNEA and Brazilian nuclear organizations.

Videla stressed that the myth of a nuclear race--with its implications of a nuclear arms race--between Argentina and Brazil has been refuted, and that instead there is an opening of concrete prospects in a vast area in which both countries have demonstrated an irreproachable line of conduct that has not always been understood.

Nuclear Accords Details

PY171944 Buenos Aires TELAM in Spanish 1710 GMT 17 May 80

[Excerpts] Buenos Aires, 17 May (TELAM)--Argentina and Brazil agreed today to cooperate in the development and application of nuclear energy for peaceful purposes in accordance with the needs and priorities of their respective national nuclear programs and keeping in mind the national commitments assumed by the two countries.

The agreement is for research and technological development of experimental and power reactors, including nuclear plants; the cycling of nuclear minerals and the manufacture of fuel elements; the production of radioisotopes and their application; radiological protection and nuclear security; and basic nuclear research for peaceful uses.

It also includes scientific and technical cooperation regarding nuclear energy, reciprocal assistance for training scientific and technical personnel, the exchange of experts and a scholarship program.

It has been agreed to form mixed working groups to carry out studies and concrete projects of scientific research and technological development. The reciprocal supply of equipment, materials and services and the exchange of research information were also agreed upon.

The two countries will facilitate the reciprocal transfer, loan, lease and sale of nuclear materials, establishing that they can only be used for peaceful purposes.

The agreement will go into effect on the date of the exchange of ratification instruments, which will be held in Brasilia, and will last for 10 years and can be automatically extended for successive periods of 2 years, unless 6 months before the end of any period one of the parties notifies the other of its intention not to extend it.

Another agreement was signed regarding nuclear energy by which the Argentine National Atomic Energy Commission (CNEA) and the Brazilian National Nuclear Energy Commission (CNEN) agreed to cooperate in scientific research and in promoting the use of radioisotopes and radiation. The cooperation between the two commissions includes reciprocal assistance, the exchange of technicians, a scholarship program and the formation of mixed working groups to carry out studies and concrete projects.

In another agreement signed regarding nuclear cooperation, the two commissions will cooperate in uranium research, prospecting and exploitation, including the manufacture of zircaloy and fuel elements.

The two countries will carry out the reciprocal transfer, loan, lease and sale of nuclear materials, equipment and services necessary for joint programs and national programs of development in the use of atomic energy.

The fourth agreement on atomic energy is a protocol of industrial cooperation signed by the respective national commissions and is related to industrial cooperation. According to this agreement, the necessary commercial arrangements for cooperation on matters related to zircaloy, aluminum concentrate and the treatment of minerals will be carried out as soon as possible in accordance with the needs and priorities of their respective programs.

CSO: 5400

TEXT OF NUCLEBRAS ANNUAL REPORT FOR 1979

Brasilia CORREIO BRAZILIENSE in Portuguese 18 Apr 80 pp 9-12

[Text] The executive board of the Brazilian Nuclear Corporation (NUCLEBRAS) presents to its stockholders the results of the activities carried out by the corporation during 1979.

NUCLEBRAS, established on 16 December 1974 by Law No 6,189, completed its fifth year of activity in 1979.

The past fiscal year was marked by the intensification of construction work on the industrial facilities of the NUCLEBRAS Group as well as by the positive results achieved in the area of uranium prospecting and exploration.

Activities within the framework of the nuclear agreement signed with the Federal Republic of Germany continued normally.

1. Industrial Projects

The principal industrial activities of the NUCLEBRAS Group are being carried out at the following places:

Pocos de Caldas industrial complex (mine and uranium ore treatment plant);

Resende industrial complex (conversion plant, uranium enrichment plant and fuel element factory);

Heavy equipment factory;

Almirante Alvaro Alberto nuclear power station (Angra dos Reis);

Irradiated fuel reprocessing pilot plant.

The activities of the NUCLEBRAS Group companies are being carried out with foreign technical assistance but with the increasing participation of a significant number of national engineering companies.

1.1. Pocos de Caldas Industrial Complex

The Pocos de Caldas industrial complex, in the municipality of Pocos de Caldas, Minas Gerais, will produce annually approximately 550 tons of uranium concentrate, U_3O_8, in the form of ammonium diuranate and approximately 275 tons of calcium molybdate. It will be the first Brazilian industrial facility for the production of uranium concentrate required by the Brazilian nuclear program.

The Pocos de Caldas industrial complex is comprised of the mine and the ore treatment plant; the latter includes the physical handling and processing facilities and the facilities for the chemical processing of the ore.

The deposit to be exploited is formed by three mineralized bodies and is being mined by the open-cut method, a total volume of excavation of approximately 85 million cubic meters. The initial production will be approximately 2,500 tons of ore per day.

The main activities carried out during 1979 with a view to installation of the Pocos de Caldas industrial complex were:

Continuation of services for the removal of burden from the mine, amounting to approximately 29 million cubic meters;

Conducting 25,500 meters of test drilling for a geologic check of mineralization;

Continuation of the process of purchasing equipment, almost all of it on the domestic market;

Beginning of the second phase of civil construction;

Beginning of electromechanical assembling services;

Implementation of metallic structure assembling services.

1.2. Resende Industrial Complex

The Resende industrial complex in the state of Rio de Janeiro will be comprised of the conversion plant, the uranium enrichment plant and the fuel element factory.

For installation of the complex, there are support and infrastructure projects that will become part of the enterprises during commercial operation. The Hydroservice company completed the detailing projects during 1979.

A brief description of the status of the installation of the industrial units of the Resende industrial complex as of the end of 1979 is given as follows:

1.2.1. Conversion Plant

As a result of the signing of the contract for basic engineering services with the French firm Uranium Pechiney Ugine Kuhlman (UPUK) at the end of 1978, the necessary structure was set up for the installation of the conversion plant, which will process the uranium concentrate (yellow cake) to transform it into uranium hexafluoride (UF_6) to be used in the enrichment plant.

The investment envisaged for the installation of the conversion plant is in the order of $65 million over a period of 48 months and its production capacity is 2,000 tons per year.

1.2.2. Enrichment Plant

The uranium enrichment plant is the responsibility of the NUCLEBRAS Isotopic Enrichment Corporation (NUCLEI), a subsidiary of NUCLEBRAS, with 25 percent of its effective capital belonging to the German companies STEAG and INTERATOM.

The authorized capital of the enterprise was increased to 2,253,659,000 cruzeiros in March 1979.

NUCLEI is implementing the first phase of its objective with the installation of the first cascade for the enrichment of uranium by the centrifugal jet process, with a total of 24 stages, the operational tests of which are scheduled for 1983. The second phase will consist of the installation of a demonstration plant.

The license for the foundations having been obtained from the National Nuclear Energy Commission (CNEN), work began in May 1979.

The main imported equipment was ordered, including compressors, separation elements and some special materials. Contracts were signed with Brazilian firms for supplying equipment to complement the systems ordered abroad.

The Machinery and Equipment Financing Fund (FINAME) granted qualifying certificates for financing the domestic equipment in the amount of 1,046 million cruzeiros.

Two contracts were signed with the Brazilian Electric Power Company (CBEE) to supply power: one will cover requirements for the project period, and the other, larger one, will take care of the demand for a power of 69 KV for the operation of the plant.

The International Engineering Corporation (IESA), a Brazilian firm, will be responsible for management of the project, detailing engineering and purchasing engineering.

1.2.3. Fuel Element Factory

The detailed project of the civil works for the first stage of installation of the fuel element factory was completed.

The detailed project of the process of the second stage of installation--the production of pellets--has also been completed, and the project of the process of the third stage--the production of UO_2 powder--is underway.

The services pertaining to the foundation and structure of the process building were completed and finishing work on that building as well as on the construction of the utility building were begun.

During 1979, activities pertaining to the purchase of process equipment and utilities necessary for the first stage of installation of the factory (a national participation index in the order of 60 percent was achieved) were carried out.

The program of training the Brazilian technicians who are members of the fuel element factory operation team continued as planned in the facilities of RBU in the Federal Republic of Germany.

The preoperational program of environmental monitoring for the Resende industrial complex was prepared and analyses of the water, soil and air were begun, taking as a basis the results of the survey of water and land use in the region. The program will make it possible to establish the reference conditions for monitoring the operation of the planned industrial units.

1.3. Heavy Equipment Factory

By the end of 1979, the installation of the factory of heavy components for nuclear plants, in charge of NUCLEBRAS Heavy Equipment Corporation (NUCLEP), a subsidiary of NUCLEBRAS, reached a stage of development that will permit the beginning of operations in the second quarter of 1980.

By the end of 1979, the activities pertaining to the installation of the factory were complete in the industrial area, with the exception of the "Clean Condition Room" (controlled environment compartment) building.

The main shed of the factory has an area of approximately 38,200 square meters, with a length of 200 meters and overhead clearance of 28 meters; loads of up to 600 tons can be moved by means of traveling cranes which are already installed.

In the main shed is the principal machinery involved in the production process, half of which was already installed as of the end of 1979.

It must be pointed out that a substantial part of the machinery installed in NUCLEP is nationally produced, including the 16 traveling cranes, 3 of which have the capacity to move loads of up to 300 tons.

The factory's auxiliary shed, which has been completed and the machinery of which has been tested, occupies an area of 3,960 square meters (2,200 square meters covered).

The program for training NUCLEP personnel is being carried out in Brazil and abroad. Of a total of 69 technicians to be trained in Europe, 19 engineers and 16 middle-level technicians have already returned to Brazil. At the end of 1979, 15 technicians were undergoing training in the facilities of KWU and GHH in the Federal German Republic and of VAL in Austria.

In Brazil, 98 apprentices of various specialties have been undergoing training since 1979 in the Rio de Janeiro Navyyard and 30 welders are being trained at NUCLEP itself.

1.4. Nuclear Power Stations

Angra-1

The participation of NUCLEBRAS in Angra-1 will be limited to the future supplying of fuel for recharges.

Angra-2 and -3

Some activities pertaining to units 2 and 3 of the Almirante Alvaro Alberto nuclear power station were contracted by Furnas with the NUCLEBRAS Engineering Corporation (NUCLEN), a subsidiary firm of NUCLEBRAS, in which it participates with 75 percent of the capital and KWU with 25 percent, comprising specifically the services of detail engineering, of the civil construction project, and supervision of the civil construction of the electromechanical assembly.

In 1979 NUCLEN performed services for Angra-2 and -3 amounting to 2,364 man/months, compared to 1,949 man/months in 1978, which represents an increase of 21 percent.

1.4.1. Industrial Promotion

In 1979 the industrial promotion program, which had already qualified more than 350 national companies obtained an increase in the index of national participation of components for the nuclear power stations, implemented an agreement with the Studies and Projects Financing Agency (FINEP) for the technical qualification of companies and began contacts with the

National Economic Development Bank (BNDE) aimed at the utilization of the Scientific-Technical Development Fund (FUNTEC).

With regard to the implementation of activities in previous years, we can underscore the following items:

The analyses for identification of the components the manufacture of which is technically feasible in Brazil were intensified;

Efforts were renewed for qualification of national suppliers, especially for metallic material, welding material, piping, etc.;

Registration of the Brazilian firms interested in participating in the program for the construction of nuclear power stations was continued with a view to prequalification for supplying components and services at the required quality levels.

With regard to the transfer of technology in the nuclear area, NUCLEN continued to give the necessary support to national companies in their negotiations with the foreign possessor of the technology and with the National Industrial Property Institute (INPI) in order to move forward with the 31 contracts in the phase of negotiation.

1.5. Pilot Plant for Reprocessing of Irradiated Fuel

After the conclusion of the conceptual project of the reprocessing pilot plant, the basic and detailed engineering projects were begun. The work is being carried out in Dortmund, Federal Republic of Germany, with the active participation of NUCLEBRAS engineers. At the same time, six engineers received training at the facilities of the KFK-Institut fur Heisse Chemie and at the WAK-German Reprocessing Plant in Karlsruhe, in the areas of instrumentation and control, nuclear safety, analytical control and process development. Work continues on the drafting of the preliminary safety analysis report, necessary for initiating the process of approval of sites with the National Nuclear Energy Commission (CNEN).

2. Mineral Prospecting and Exploration

As the principal result of the activities of mineral prospecting and exploration, the reserves of uranium ore increased by 51.3 percent, with reference to the official figures for December 1978. Thus the fiscal year 1979 concluded with a reserve of 215,300 tons of uranium compared with the 142,300 tons of the previous fiscal year.

Implementation of the work program in 1979 was carried out as follows:

2.1. Selection and Checking of Areas in:

Bolena (Rio Grande do Sul), Quixada (Ceara), Santarem-Cachimbo (Para), Transamazonica (Para), Itapecuru (Maranhao/Piaui), Alenquer (Para), Taquarucuzinho (Maranhao), Escudo Sul Riograndense (Rio Grande do Sul), Diamantina (Minas Gerais), Espinhaco Setentrional [Northern ridge] (Minas Gerais), Rondonopolis (Mato Grosso do Sul), Surumu (Rondonia), Borda Sul da Bacia do Parnaiba [Southern bank of the Parnaiba Basin] (Piaui), Iguatu (Ceara), Bodoquena (Mato Grosso do Sul), Barreiro (Mato Grosso/Goias), Sao Timoteo (Bahia), Domo da Araguainha (Goias), Piaui/Maranhao Basin (Piaui/Maranhao), Nova Lima (Minas Gerais), Serra de Itiuba (Bahia), Jaguaribe (Ceara), Catalao Sul (Goias), PGBC (Goias/Maranhao/Para), Itaberaba/Belmonte (Bahia), Rio Acarau (Ceara/Piaui), Furnas (Minas Gerais) and Serra da Mesa (Goias).

2.2. Prospecting for Nuclear Minerals in the Areas of:

Sao Mateus do Sul (Parana), Cerro do Bulao (Rio Grande do Sul), Lagoa Real (Bahia), Rio Preto (Goias), Serido (Rio Grande do Norte), Cerro Partido (Rio Grande do Sul), Sao Francisco (Parana), Campos Belos (Goias), Rio Groiras (Ceara), Ipora/Amorinopolis (Goias), Triunfo (Para), Gandarela (Minas Gerais), Pocos de Caldas Plateau (Minas Gerais) and Itataia (Ceara).

2.3. Mineral Exploration in:

Figueira (Parana), Amorinopolis (Goias), Lagoa Real (Bahia), Itataia (Ceara), Rio Preto (Goias), Campo do Agostinho (Minas Gerais) and Gaivotas (Minas Gerais).

The table shows the situation of the reserves in various deposits comparing the results of 1978 and 1979.

The mineral reserves in the categories "Measured and Indicated" and "Inferred" are defined as stipulated in the regulation of the mineral code and with a level of reliability of 95 percent.

The chart shows that the increase of the overall reserves is due to a concentration of effort in the Itataia (Ceara) and Lagoa Real (Bahia) deposits, where there was an increase of 72 and 390 percent, respectively, with reference to the figures for 1978.

The evaluation made in April 1979 which revealed large-scale reserves in the Itataia deposit, directed the corporation toward increasing the degree of precision of those reserves in preference to their overall increase.

The concentration of exploration work in the Itataia area made possible by the end of the year a 73 percent increase in "Measured and Indicated" reserves, maintaining the total of 122,500 recorded in April 1979.

In the country as a whole, "Measured and Indicated" reserves increased 71 percent, amounting to 126,000 tons of U_3O_8, which is equivalent to 88 percent of overall reserves for all categories at the end of 1978.

The NUCLEBRAS Mining Auxiliary Corporation (NUCLAM), a subsidiary of NUCLEBRAS, which holds 51 percent of its capital, the remaining 49 percent being held by the URANGESELLSCHAFT Company, continued its prospecting activities in the selected areas of the states of Paraiba, Pernambuco, Goias and Bahia.

The table gives an overall view of the results achieved in 1979, by type of activity carried out.

In 1979, investments in mineral prospecting and exploration amounted to about 425,447,000 cruzeiros at average 1979 prices.

In the overall activity of training and specializing human resources for the mineral area, four geologists were sent to the College of Mines and Geology of Nancy, France, for specialization.

Geological Uranium Reserves in Metric Tons in U_3O_8 (Dec/79)

NUCLEBRAS	Type of Reserve					
	1978			1979		
	Measured & Indicated	Inferred	Total	Measured & Indicated	Inferred	Total
1. Pocos de Caldas Plateau - MG	20,000	6,800	26,800	20,000	6,800	26,800
1.1 Caldas Municipality	17,200	4,600	21,800	17,200	4,600	21,800
1.2 Other plateau areas	2,800	2,200	5,000	2,800	2,200	5,000
2. Figueira, Parana	7,000	1,000	8,000	7,000	1,000	8,000
3. Iron-bearing quadrilateral - MG	5,000	10,000	15,000	5,000	10,000	15,000
4. Amorinopolis - GO	2,000	3,000	5,000	2,000	3,000	5,000
5. Campos Belos - GO	500	500	1,000	500	500	1,000
6. Itataia - Ceara	34,000	37,000	71,000	83,000	39,500	122,500

NUCLEBRAS	Type of Reserve					
	1978			1979		
	Measured & Indicated	Inferred	Total	Measured & Indicated	Inferred	Total
7. Lagoa Real - BA	-	5,500	5,500	3,500	23,500	27,000
8. Espinharas (NUCLAM)	5,000	5,000	10,000	5,000	5,000	10,000
General total (NUCLEBRAS, NUCLAM)	73,500	68,800	142,300	126,000	89,300	215,300

3. Mineral Engineering

In the mineral engineering area, the following results and activities should be underscored:

In the Figueira project, the ore treatment process was consolidated, the analytical laboratory in the area was installed, 720 meters of exploratory galleries and the final economic feasibility study were completed;

In the Itataia project, work of physical and chemical beneficiation of the ore was carried out and studies on the siting of the mining-industrial project were begun;

In the Amorinopolis project, the conceptual engineering project of the project was completed and the certificate for coordination of the basic project was issued.

4. Production of Heavy Minerals

NUCLEBRAS Monazite and Associated Elements, Ltd (NUCLEMON) completely fulfilled the program established for 1979, is proceeding with the exploitation of the present deposits and investing in the exploration of new areas with a view to acquiring reserves that will make it possible to increase its production year after year.

5. Research and Development

The Nuclear Technology Development Center (CDTN), installed in Belo Horizonte, continued to operate in 1979 according to the guidelines of rendering support to the industrial units of NUCLEBRAS and to the implementation of research and development tasks of direct interest to the nuclear program.

In pursuance of the activity of maintaining relations between the CDTN and other similar organizations in the country and abroad, the work contracts with the German nuclear centers of Julich and Karlsruhe were maintained and broadened, the bases for collaboration with Materialprufungsanstalt of Stuttgart were established and the bases for collaboration with KWU for the testing of components were studied.

The members of the recently created consultative committee of the CDTN were installed at the end of the fiscal year. It is comprised of the NUCLEBRAS directors in charge of the research and development area, the general superintendent of research and development of NUCLEBRAS, the president of the Brazilian Academy of Sciences, the president of the National Scientific and Technological Development Council, the secretary of science and technology of the Ministry of Mines and Energy, the secretary of the Ministry of Industry and Commerce, the rector of the Federal University of Rio de Janeiro, the rector of the Federal University of Minas Gerais and the president of the Technological Research Institute of Sao Paulo.

Following is a brief description of the principal activities during 1979:

5.1. Infrastructure and Internal Support

A laboratory certified by specialists of the Karlsruhe nuclear center for testing the decontaminability of paints was established. The laboratory is already providing services to NUCLEN.

5.2. Water Reactors and Advanced Reactors

The activities of the program of utilization of thorium in pressurized-water reactors developed jointly with the Julich nuclear center was initiated in 1979.

An agreement was signed with the Science and Technology Foundation (CIENTEC) of Rio Grande do Sul to conduct experimental studies pertaining to the gasification of coal in the terms of the special agreement signed by NUCLEBRAS for Brazil and the Julich nuclear center and Kraftwerk Union for the Federal Republic of Germany. The object is to evaluate the feasibility of utilizing heat generated by nuclear reactors for the gasification of coal.

The experiments with the CAPITU subcritical heavy-water system were completed, partial reports pertaining to each experiment conducted were published and a technical [illegible] containing all the data obtained during the 4 years of the experiments was established.

The initial steps were taken to establishment of a support infrastructure for nuclear power stations in the areas of commissioning and fuel service.

5.3. Fuel Element

The work of irradiation of prototype fuel element rods carried out jointly with the Julich nuclear center continued.

The establishment of the laboratory for studies of ceramic fuel is at an advanced phase, closely connected with the technical support for the future operation of the fuel element factory and with the studies on the use of thorium in light-water reactors.

5.4. Technology of Materials

The pressurized hydraulic circuit project with a view to studying the phenomenon of corrosion under dynamic conditions comparable to those of a pressurized-water reactor was developed.

Assistance was given to Furnas in the tests for certification of the steam-generating system and the pressure vessel of Angra-1, utilizing ultrasound and parasitic current techniques.

With the arrival of two German missions to train personnel in welding techniques, the CDTN is beginning to achieve competence of an international level in that area.

The tension analysis laboratory is undergoing rapid development with engineers of the CDTN participating in the extensiometric tests of the turbines of the Sao Simao hydroelectric plant at the request of the Minas Gerais Electric Power Station Corporation (CEMIG).

5.5. Uranium Enrichment

A uranium enrichment pilot plant utilizing the centrifugal jet process of the Karlsruhe Nuclear Center was transferred to the CDTN. The beginning of operations of that facility is scheduled for the first 4-month period of 1980.

5.6. Treatment of Radioactive Waste

The initial tests of the iodine filter system were carried out successfully. Packaging for the transportation of radioactive materials was designed and constructed and certificates of approval of the packaging were supplied after the tests prescribed by the rules of the International Atomic Energy Agency and the National Nuclear Energy Commission.

5.7. Mineral Technology

During 1979, this program processed about 300,000 evaluations in 80,000 samples of ore from various parts of the country through methods of instrumental and chemical analysis of the most varied types.

Uranium-bearing ores or ore of interest to the nuclear industry were treated at the pilot facilities of the CDTN with samples of ore from Figueira, Itataia, Lagoa Real and Agostinho.

5.8. Application of Radioisotopes

This CDTN group, which has a level of competence that is unique in the country, continued to supply the Brazilian Port Authority (PORTOBRAS) with services pertaining to dredging of the port of Belem and to studies of waves off Cape Santo Agostinho conducted by SUAPE of Pernambuco, and presented work plans for studies in the ports of Manaus and Santos. The group sponsored a course on thermal waste engineering given by MIT professors with the participation of engineers from the various Brazilian institutions. It provided regular assistance to the Brazilian Petroleum Corporation (PETROBRAS) in maintaining oil pipelines, including underwater pipelines.

6. Human Resources

In the area of human resources, great emphasis was given to the activities of training, specialization and advanced training with a view to the transfer of nuclear technology to and assimilation by Brazilian professionals.

Since 1974, 431 high and middle-level technicians have been sent abroad for training. In 1979 alone, 90 professionals were sent abroad for specialization in the fields of reactor engineering, heavy components, the manufacture of fuel elements, isotopic enrichment, reprocessing, radiological protection and safety, technical-scientific research and development, quality control and prospecting, mining and beneficiation of ore.

Under the sponsorship and monitoring of NUCLEBRAS, nuclear technology courses at the postgraduate level were given in Brazil through agreements concluded with the Federal Universities of Rio de Janeiro and Minas Gerais. In those courses, during 1979, 71 professionals in the physical and chemical engineering areas were specialized in nuclear technology which, added to those of the previous years, represent a total of 392 trained technicians. In addition to the courses of specialization in nuclear technology, several other courses were given, such as those in quality control, mineral prospecting and exploration, and industrial training, making a total of 1,060 advanced-level specialized technicians from 1974 to 1979.

Year	1974	1975	1976	1977	1978	1979	Total
Brazil	Number of Participants						
Specialization in nuclear technology	--	71	76	73	101	71	392
Quality control	135	57	--	95	--	--	287
Mineral prospecting and exploration	--	--	28	33	42	23	126
Industrial training	14	8	54	33	14	132	255
Total in Brazil	149	136	158	234	157	226	1,060
Abroad	Number of Participants						
Reactor engineering	3	10	17	26	51	23	130
Heavy components	--	--	--	--	41	5	46
Fuel element factory	4	10	3	3	10	27	57
Enrichment	--	4	4	3	11	2	20
Processing	3	2	2	2	9	5	23
Radioactive protection and safety	1	1	4	3	3	2	14
Research and development	15	9	4	3	9	11	51
Mineral prospecting and exploration, mining and beneficiation	--	1	7	18	49	15	90
Total abroad	26	37	37	58	183	90	431
General total	175	173	195	292	340	316	1,491

7. Administrative Activities

The administrative organs formerly located in Botafogo, in Flamengo Beach and Alfandega Street were moved to the Cultural Center of Brazil Building, the present central headquarters of NUCLEBRAS on 231 Presidente Wilson Avenue.

8. NUCLEOS

The NUCLEBRAS Social Security Institute (NUCLEOS), the establishment of which was authorized by the special general assembly of stockholders on 20 December 1978, is a nonprofit corporation maintained under a system of coparticipation by NUCLEBRAS, its subsidiaries and its employees for the purpose of providing the latter with a supplement to the benefits provided by the official social security system in terms of retirement for length of service, disability, old-age and especially of pension, sick aid, confinement aid and annual bonus.

9. Activities in the Data-Processing Area

Considering the prospect of a progressive demand for services in the data-processing area, with the need of computer support for technological projects and especially the transfer of nuclear codes received from Germany, the general data-processing plan was drafted. Having been approved by the executive board of the corporation and evaluated by the Commission for the Coordination of Electronic Processing Activities (CAPRE), it resulted in approval of the purchase of a large CDC-6600 computer by NUCLEBRAS. At the same time, with the installation in the Pocos de Caldas Industrial Complex (CIPC) of a data-processing unit, the installation of decentralized units which will comprise a unified teleprocessing network was initiated.

10. Economic-Financial Activities

The implementation of NUCLEBRAS' work program in its fifth year of activity is shown by the principal economic-financial data that follow:

The subscribed and integrated capital of the enterprise was increased from 1,675,058,350 to 1,842,564,185 cruzeiros through the incorporation of available reserves in the amount of 167,505,835 cruzeiros.

The real increase in the assets of NUCLEBRAS, that is, including the monetary correction factor provided in Law No 6,404 of 15 December 1976 (Corporation Law) was in the order of 10,049 million cruzeiros, being covered by an increase in indebtedness of 8,143 million cruzeiros by federal credits for a capital increase in the amount of 688 million cruzeiros and by subsidies for investment for a total of 1,218 million cruzeiros.

As a consequence of the current investment phase of NUCLEBRAS, all costs and expenditures incurred as well as contingent receipts were deferred to be acknowledged in the results of future fiscal years, following the beginning of normal operation of the projects.

10.1. Expenditures Incurred

NUCLEBRAS and its subsidiaries and associate incurred expenditures with investments and to cover operational expenses which amounted to 11,067.9 million cruzeiros during the fiscal year, of which 6.660.3 million were incurred by NUCLEBRAS in its own projects and 4,407.6 million [by its subsidiaries and associate], as shown in the following table (amounts in 1,000 cruzeiros):

Itemization	1979	1978
1. NUCLEBRAS' own projects	6,660,282	3,026,580
1.1. Prospecting and exploration of nuclear ore and associated minerals	425,447	337,856
1.2. Technological research	364,259	220,116
1.3. Pocos de Caldas industrial complex	* 4,632,651	1,355,490
1.4. Fuel element factory	** 583,878	5,790
1.5. Irradiated fuel reprocessing plant	403,692	44,503
1.6. Infrastructure of industrial projects - Resende industrial complex	19,791	54,646
1.7. Conversion plant	21,166	156
1.8. Nuclear fuel imports	155,432	994,463
1.9. Simulator project	53,966	13,560
2. Subsidiaries and Associate	4,407,648	2,454,185
2.1. NUCLAM - NUCLEBRAS Mining Auxiliary Corp - Uranium prospecting and exploration	111,135	72,567
2.2. NUCLEN - NUCLEBRAS Engineering Corp - Engineering services for nuclear plants and related projects	810,023	570,700
2.3. NUCLEP - NUCLEBRAS Heavy Equipment Corp - Factory of heavy components for nuclear plants	2,090,184	1,169,069
2.4. NUCLEI - NUCLEBRAS Isotopic Enrichment Corp - Uranium enrichment demonstration plant	906,177	278,391
2.5. NUSTEP ENTWICKLUNGS UND PATENTVERWERTUN - GESELLSCHAFT mbH & Co KG - Development of uranium enrichment technology	191,011	152,104
2.6. NUCLEMON - NUCLEBRAS Monazite and Associated Elements Ltd - Exploration, mining and industrialization of ore containing nuclear elements	299,118	211,354
Total	11,067,930	5,480,765

* Includes prorating of central administration and financial charges totaling 2,791,892 x 10^3 cruzeiros.

** Includes prorating of central administration and financial charges totaling 351,877 x 10^3.

10.2. Funds and Applications

In 1979, NUCLEBRAS and its subsidiaries and associate received and managed funds in the amount of 11,008 million cruzeiros compared to 5,481 million in 1978, as shown in the following table (amounts in 1,000 cruzeiros):

Funds	Applications	1979	1978
1. Funds received from the federal government		2,106,465	1,073,073
1.1 National Nuclear Energy Commission - CNEN	Nuclear technology development program	20,185	177,353
1.2 Law 5,876 - Continental shelf	Formation of stocks of nuclear materials	146,447	72,771
1.3 National Scientific and Technological Development Fund - FNDCT	Development of reactor technology and nuclear fuels	34,900	59,850
1.4 Single tax on lubricants and liquid and gas fuels - IULCLG	Prospecting for nuclear ore	245,053	259,599
1.5 Secretariat General of the Ministry of Mines and Energy - SG/MME	Federal participation in NUCLEBRAS capital	331,300	241,000
1.6 Paragraph I, Decree-Law No 1,681/79	Research and development of nuclear ores and the technology of nuclear ores, and in the installation of nuclear fuel cycle units	971,080	--

Name of Financing Institution	Applications	1979	1978
2. Funds from loans and financing		6,962,232	3,095,817
2.1 Bank of Brazil Inc Financing contract	Development of uranium enrichment technology by the centrifugal jet process in Germany	256,451	106,060
2.2 Credit Chimique - France Export credit contract	Construction of uranium ore-treatment plant in Pocos de Caldas	13,643	10,190

Name of Financing Institution	Applications	1979	1978
2.3 Consortium of banks headed by Compagnie Luxembourgeoise of the Dresdner Bank AG Cash loan contract	Covering of downpayment of the contract for the manufacture of fuel elements for units 2 and 3 of the Almirante Alvaro Alberto nuclear power station. Prepaid on 21 February 1979.	--	75,520
2.4 Consortium of banks headed by Barclays Bank International Ltd Cash loan contract	Financing of the downpayment of 6 percent of the uranium enrichment services to be provided by URENCO Ltd, and the insurance premium to ECGD. Prepaid on 21 February 1979.	--	474,050
2.5 Consortium of banks headed by Compagnie Luxembourgeoise of the Dresdner Bank AG Cash loan contract	Covering of local costs pertaining to Brazilian nuclear program projects	--	484,500
2.6 Consortium of banks headed by Compagnie Luxembourgeoise of the Dresdner Bank AG Cash loan contract	Financing of the downpayment on the purchase of equipment for NUCLEP	--	86,994
2.7 Credit Chimique - France Cash loan contract	Construction of the uranium ore-treatment plant in Pocos de Caldas. Prepaid on 9 May 1979.	--	--
2.8 Development Bank of the State of Rio de Janeiro	National equipment for NUCLEP	213,858	96,341
2.9 Boavista Bank Inc	National equipment for the Pocos de Caldas industrial complex	112,297	5,785
2.10 Westdeutsche Landesbank International Inc, Luxembourg Cash loan contract	Working capital. Prepaid on 20 February 1979	--	--

	Name of Financing Institution	Applications	1979	1978
2.11	FINEP Studies and Projects Financing Agency	Covering 80 percent of the engineering contract for the fuel element factory	--	9,435
2.12	FINEP Studies and Projects Financing Agency	National engineering services contracted by NUCLEP	16,378	27,431
2.13	AKA - Ausfuhrkredit Gesellschaft mbH Export credit contract	Equipment for NUCLEP	158,372	59,214
2.14	KFW - Kreditanstalt fur Wiederaufbau Export credit contract	Equipment for NUCLEP	158,372	59,214
2.15	Urangesellschaft Financing of partner - Release of 80 percent of the loan of the DM 2 million loan held in the Central Bank of Brazil (Resolution 479/78)	Covering NUCLAM investments	18,257	4,583
2.16	AKA Export credit contract	Equipment for the NUCLEBRAS fuel element factory	15,512	--
2.17	AKA Export credit contract	Reprocessing pilot plant	39,903	--
2.18	KFW Export credit contract	Reprocessing plant	39,903	--
2.19	KFW Export credit contract	Fuel recharges for Angra-1	12,524	--

Name of Financing Institution		Applications	1979	1978
2.20	Consortium of banks headed by Dresdner Bank AG	Fuel recharges for Angra-1	12,524	--
2.21	Societe Generale/ Credit Chimique	Equipment for the uranium ore-beneficiation plant	20,525	--
2.22	Urangesellschaft Financing of partner	Cover NUCLAM investments	69,771	--
2.23	FINEP	Cover 80 percent of the contract for providing engineering services for the Pocos de Caldas industrial complex	24,325	--
2.24	Real de Investimentos Co	National equipment for the fuel element factory	7,528	--
2.25	WestLB International Inc Financing contract	Loan to cover various projects of the Brazilian nuclear program	2,352,452	--
2.26	Consortium of banks headed by Compagnie Luxembourgeoise of the Dresdner Bank AG Dresdner Bank International	Loan for prepayment of various contracts in Eurocurrency	842,795	--
2.27	Consortium of banks headed by WestLB International, Inc	Loan to cover various projects of the Brazilian nuclear program	1,249,618	--
2.28	Safra Bank Inc - NUCLEP	Financing of working capital	50,000	--
2.29	Safra Bank Inc - NUCLEN	Financing of working capital	50,000	--

Name of Financing Institution	Applications	1979	1978
2.30 FINAME - Real Bank Inc	Financing for purchase of equipment for NUCLEMON	6,548	--
2.31 Transactions with promissory notes on the national financial market - NUCLEBRAS		1,220,676	--
3. Funds Received From Partners	Advances to increase capital	63,272	129,592
4. Funds Received From Others	Capital subscription	--	385
5. Grant: United Nations Program	Nuclear power station simulation project	30,154	8,965
6. Operational Receipts - subsidiaries		840,401	406,180
7. Financial Receipts - subsidiaries		15,788	7,970
8. Various Receipts - NUCLEBRAS		103,946	297,701
9. Other Sources		945,672	--
10. Total (1 through 9)		11,067,930	5,480,765

10.3. Credit Operations

As a result of negotiations conducted, NUCLEBRAS carried out foreign credit transactions in 1979 for a total of approximately $63.5 million as well as domestic credit transactions for 140.9 million cruzeiros with FINEP and 100 million cruzeiros with FINAME.

A contract was signed with FINAME by the NUCLEP subsidiary in the amount of 352.4 million cruzeiros, and another by the NUCLEMON subsidiary in the amount of 35 million cruzeiros.

Contracts Signed in 1979

Name of Financing Institution	Purpose of Contract	Currency	Amount (1,000)
1. Consortium of banks headed by National Bank of Paris	Financing to cover 85 percent of the contract to supply equipment signed with Le Material Telephonique Ltd for the nuclear power station simulator. Contract signed on 15 February 1970	FF	16,856
2. Consortium of banks headed by Westl[illegible] International [illegible]	Loan to cover various projects of the Brazilian nuclear program. Contract signed on 16 May 1979	US$	50,000
3. Bank of Brazil - Panama	Financing of the development of uranium enrichment technology by means of the centrifugal jet process. Contract signed on 11 July 1979	DM	18,000
4. Real de Investimentos Co, Inc	Financing for the purchase of national equipment for the fuel element factory through FINAME. Contract signed on 17 August 1979	CR	Credit limit up to 100,000
5. FINEP	Financing to cover 80 percent of the contract for providing engineering services for the Pocos de Caldas industrial complex. Contract signed with NATRON on 19 February 1979	CR	123,000
6. FINEP	Financing to cover 60 percent of the contract for engineering technical services and management of the installation of the Resende industrial complex project. Contract signed on 26 November 1979	CR	17,862
7. FINAME - Bank of the State of Rio de Janeiro - BANERJ	Financing for the purchase of equipment for NUCLEP. Contract signed on 7 February 1979	CR	352,405

Name of Financing Institution	Purpose of Contract	Currency	Amount (1,000)
8. FINAME - Real Bank Inc	Financing for the purchase of equipment for NUCLEMON (Letter of credit)	CR	35,000
9. Transactions with promissory notes - subsidiaries	Financing working capital		
9.1 Safra Bank Inc - NUCLEP	Contract signed on 29 October 1979	CR	50,000
9.2 Safra Bank Inc - NUCLEN	Contract signed on 25 October 1979	CR	50,000
10. Transaction with promissory notes NUCLEBRAS	Financing of working capital	CR	220,676

Paulo Nogueira Batista, president; Jose Pinto de Araujo Rabello, director-superintendent; John Milne Albuquerque Forman, director; Ney Freire de Oliveira Junior, director; Eduardo Calmon Costa, director; Ilmar Penna Marinho Junior, director; Vicente da Costa Silva, director.

Financial Statement as of 31 December 1979 and 1978
(in 1,000 cruzeiros)

Assets	1979	1978
Circulating		
Cash and banks	220,676	17,510
Financial applications	220,253	172,512
Accounts receivable	52,922	98,959
Costs of current services to be recovered	517,834	57,826
Mandatory deposits for imports	59	26,289
Deposits in foreign currency - Central Bank circular No 349	562,129	3,736,739
Miscellaneous credits	141,381	76,161
Expenditures of following fiscal year	--	9,936
	1,715,254	4,195,032
Long-Term Receivables		
Financing of subsidiaries	4,772,529	1,605,589
Advances to subsidiaries and associate for future capital increase	742,247	540,326
Miscellaneous credits	43,084	27,715
	5,557,860	2,173,630

Assets (Continued)	1979	1978
Permanent		
Investments	1,457,919	654,473
Fixed	4,301,507	1,551,311
Deferred	11,831,698	3,649,954
	17,591,124	5,855,738
	24,864,238	12,224,400

Liabilities	1979	1978 (Reclassified)
Circulating		
Suppliers	767,488	214,425
Credits of subsidiaries	19,642	7,698
Social and labor assessments	37,690	33,577
Financial institutions (minus interest due: 313,290 cruzeiros in 1979 and 180,160 in 1978)	2,263,778	1,908,847
Other	613,065	171,897
	3,701,663	2,336,444
Long-Term Payable		
Financial institutions	12,585,351	5,817,051
Funds for formation of nuclear stocks (Law 5,876/73)	209,564	--
	12,794,915	5,817,051
Liquid Assets		
Authorized capital	5,449,474	4,000,000
Minus capital to be subscribed	3,606,910	2,324,942
Subscribed and integrated capital	1,842,564	1,675,058
Capital reserves	5,497,528	2,083,409
Profit reserves	50,841	34,541
Accrued profits	31,413	21,383
	7,422,346	3,814,391
Federal credits to increase capital	945,314	256,514
	8,367,660	4,070,905
	24,864,238	12,224,400

The annexed explanatory notes are an integral part of the financial statements.

Statement of Changes in Liquid Assets for the Fiscal Years Ending 31 December 1979 and 1978
(in 1,000 cruzeiros)

		Capital Reserves			Profit Reserves					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Total
Balances as of 31 Dec 78	1,675,058	173,425	598,787	1,311,197	2,771	2,726	29,044	21,383	258,514	4,070,905
Adjustment from previous fiscal years	—	—	—	—	—	—	—	(55)	—	(55)
Funds and subsidies received	—	—	—	1,364,241	—	—	—	—	688,800	2,053,041
Reclassification for long-term payables	—	—	—	(208,206)	—	—	—	—	—	(208,206)
Capital increase	167,506	—	(167,506)	—	—	—	—	—	—	—
Monetary correction	—	1,127,552	282,564	1,015,474	1,308	1,287	13,705	10,085	—	2,451,975
Balances as of 31 Dec 79	1,842,564	1,133,471	881,351	3,482,706	4,079	4,013	42,749	31,413	945,314	8,367,660

As of 31 December 1979, subscribed and integrated capital was represented by 983,819,000 common shares and 691,240,000 preferred shares, bearer and registered, at a par value of 1.10 cruzeiros each (1 cruzeiro in 1978).

Key:

1. Subscribed and integrated capital
2. Monetary correction of capital
3. Other monetary corrections
4. Subsidies for investments
5. Legal
6. Development of nuclear technology program
7. Special [reserves] from investments in subsidiaries and associate
8. Accrued profits
9. Federal credits to increase capital

Statement of Sources and Applications of Funds for the Fiscal Years Ending 31 December 1979 and 1978
(in 1,000 cruzeiros

	1979	1978
Sources		
Long-term financing funds	420,189	4,872,517
Subsidies for investment	1,355,692	341,348
Federal credits to increase capital	688,800	503,500
Depreciation	20,528	11,450
Other liquid sources (deducted from applications: 55 in 1979 and 23,364 in 1978)	30,099	5,687
	2,515,303	5,734,502
Applications		
Increase of fixed assets	1,770,046	1,018,835
Increase of deferred assets	1,687,370	1,703,778
Increase of financing of subsidiaries and associate	2,689,740	1,049,958
Increase of advances for future incorporation in the capital of subsidiaries and associate	203,259	312,624
Increase of other long-term receivables	7,615	17,424
Reduction of other long-term payables	--	46,118
Increase of investments	2,270	--
	6,360,300	4,148,737
Variation in circulating capital	(3,844,997)	1,585,765
Variation in circulating capital represented by:		
Circulating assets	(2,479,778)	3,632,265
Circulating liabilities	1,365,219	2,046,500
	(3,844,997)	1,585,765

The annexed explanatory notes are an integral part of the financial statements.

Paulo Nogueira Batista, president, CPF 075,071,194-91; Jose Pinto de Araujo Rabello, director, CPF 290,227,387-87; Ney Freire de Oliveira Junior, director, CPF 006,428,788-20; Eduardo Calmon Costa, director, CPF 028,426,028-20; Ilmar Penna Marinho Junior, director, CPF 021,253,317-72; Jose Berthoux Tavares, accountant, CRC-RJ 014,347-9-S-DF-349, CPF 024,188,357-15; John Milne Albuquerque Forman, director, CPF 030,922,917-00; Vicente da Costa Silva, director, CPF 000,489,689-04.

Explanatory Notes for Financial Statements as of 31 December 1979 (amounts in thousands of cruzeiros):

NOTE 1. Summary of Principal Accounting Practices

The principal accounting practices adopted by the company in the preparation of the financial statements are as follows:

Bookkeeping System for Transactions

The double-entry system is adopted for recording the changes of assets occurring during the fiscal year. Application of that system requires acknowledging receipts, costs and expenditures at the time they are earned or incurred, therefore, independently of their actual receipt or payment.

The corporation is in a preoperational phase. Under those circumstances, all costs and expenditures incurred, as well as the receipts stemming from activities of a contingent nature such as those resulting from financial applications and those pertaining to services rendered to the National Nuclear Energy Commission (CNEN) are being deferred for acknowledgement in the results of future fiscal years following the entry into normal operations.

Submittal of Financial Statements

The financial statements are being prepared and submitted in accordance with the provisions of Law 6,404/76 for stock companies, and in compliance with the rules contained in Instruction No 1 of the Negotiable Securities Commission, as applicable.

Separation of Terms of Receivable and Payable Accounts

The assets receivable and liabilities payable in terms of less than 360 days are classified as current.

Acknowledgement of Inflationary Effects

The effects of inflation on the financial statements are acknowledged by means of entering the monetary correction on the permanent and liquid assets based on the variations of the value of the ORTN [expansion unknown]. The net result of that correction is being deferred to be amortized at the time of the beginning of operations of the company. The other assets and liabilities subject to monetary corrections or adjustments due to exchange variations are also corrected and, in the same manner, the respective net results are entered in the deferred assets account for amortization against the results of future fiscal years.

Evaluation Criteria

a) Financial applications, represented by securities tied to the open market and by readjustable National Treasury Bonds are entered at the increased cost of the yield proportionally obtained up to the date of the close of the fiscal year.

b) Foreign currency deposits--Central Bank Circular No 349--are adjusted to the buying exchange rate of the corresponding amount in U.S. dollars in effect on the date of the balance statement.

c) Investments resulting from stock participation in subsidiaries and the associate are evaluated by the asset equivalence method. The other investments are entered at the corrected cost.

d) The form of amortization of the premium [agio] for investment in the associate NUSTEP GmbH & Co KG., will be determined in the future at the time of the completion of the project that is now being carried out by the associate.

e) The fixed assets are entered at the corrected cost of purchase or construction. Depreciation and amortization are calculated by the linear method through the application of rates that take into account the useful economic life of the assets and are partially apportioned to the accounts of the deferred assets and the fixed assets (projects underway).

f) The funds applied to the deferred assets are recorded at the corrected cost.

NOTE 2. Investments

	1979	1978
Stock participation in subscribers and associate	1,399,791	835,400
Minus parcels to be integrated	175,760	135,526
	1,224,031	499,874
Premium [agio] in associate	220,513	149,818
Other participations	13,375	4,783
	1,457,919	654,473

a) Composition of Investments in Subsidiaries and Associate in 1979:

Subsidiaries and associate	Partici-pation %	Liquid assets as of 31 Dec 79	Corrected cost of investment	Asset equiva-lence adjust-ment	Asset value of invest-ment
NUCLAM	51	20,018	8,758	1,451	10,209
NUCLEI	75	847,736	635,802	--	635,802
NUCLEN	75	(153,295)	1,113	(1,113)	--
NUCLEP	75	520,074	390,055	--	390,055
NUCLEMON	99.99	187,983	227,529	(39,564)	187,965
			1,263,257	(39,226)	1,224,031
NUSTEP GmbH & Co KG.	50	(212,382)	848	(848)	--
			1,264,105	(40,074)	1,224,031

b) Additional Information:

NUCLEBRAS	NUCLAM	NUCLEI	NUCLEN	NUCLEP	NUCLEMON	NUSTEP
Capital received	13,624	563,837	40,488	384,253	144,000	2,483
Number of shares or quotas held	6,948	422,877	30,328	288,190	143,999	576
Types of shares	regular	regular	regular	regular	quotas	quotas
Profit (loss) for fiscal year	56	(1)	(154,779)	(1)	(39,884)	(61,483)
Accounts receivable	447	--	2,200	--	334	2,074
Accounts payable	19,642	--	--	--	--	--
Financing	141,765	445,306	475,486	3,706,971	--	--
Advances for capital increase	67,259	97,236	22,243	--	--	555,510
Receipts	6,942	57,934	109,020	691,695	10,753	3,905
Expenditures	183	--	--	--	--	--

(1) In preoperational phase

The financial statements as of 31 December 1979 of the subsidiaries and associate were examined by independent auditors.

NOTE 3. Fixed Assets

	1979			1978
	Corrected Cost	Corrected Depreciations and Amortizations	Net Value	Net Value
Land	420,188	--	420,188	255,824
Buildings	115,529	21,282	94,247	67,171
Machinery and equipment	92,896	17,490	75,406	53,709
Facilities	33,164	5,908	27,256	9,076
Vehicles	24,280	12,721	11,559	11,551
Furniture and fixtures	78,237	19,988	58,249	28,249
	764,294	77,389	686,905	425,580
Imports underway	2,823	--	2,823	5,655
Projects underway	2,471,750	--	2,471,750	420,520
Other fixed assets	1,382	--	1,382	436
Fixed assets in process	1,138,647	--	1,138,647	699,120
	4,378,896	77,389	4,301,507	1,551,311

NOTE 4. Deferred Assets

	1979	1978
Expenditures on the uranium prospecting and exploration program	2,564,835	1,295,284
Expenditures on the development of the Pocos de Caldas deposit	2,565,487	1,124,878
Expenditures in obtaining technical information, consultation and training	1,034,779	368,852
Interest on loans and financing (minus active transactions - 167,230 in 1979 and 181,095 in 1978)	1,323,923	367,349
Liquid monetary variations	5,436,597	549,197
Monetary correction of permanent and liquid assets	(1,780,039)	(419,044)
Other expenditures (liquid assets from receipts) to be amortized minus amortization - 19,286 in 1979 and 6,552 in 1978)	647,291	351,142
Improvements to property of third parties (minus amortization: 11,970 in 1979 and 18,674 in 1978)	38,825	12,296
	11,831,698	3,649,954

NOTE 5. Financial Institutions

	Long-Term	
	1979	1978
In Foreign Currency		
Loans subject to interest rates that vary between 7.29 and 9 percent per annum and, for the cases of loans in Eurocurrency, a "spread" between 0.875 and 2 percent per annum above the London Interbank Offered Rate (LIBOR); amortization during the period 1981 to 1991.	12,418,020	5,799,276
In National Currency		
FINAME - Special Agency for Financial Medium Business		
Financing subject to interest rates that vary between 5.7 and 7 percent per annum, subject further to monetary correction based on the variation in the ORTN. For the 20 percent portion of the financing of the equipment for the fuel element factory, the rate is 58 percent per annum recontracted annually; liquidation in variable portions during the period 1981 to 1990.	134,412	5,585
FINEP		
Financing subject to interest rates that vary between 12 and 18 percent per annum, including the monetary correction preset at 10 percent per annum; amortization during the period 1981 to 1985.	32,919	11,841
Other Institutions	--	349
	12,585,351	5,817,051

The foreign currency loans are for the most part guaranteed by the endorsement of the Federative Republic of Brazil.

The FINAME loans are guaranteed by the fiduciary transfer of the equipment purchased with the loan funds.

For FINEP loans, NUCLEBRAS offered the assessments of the single tax on lubricants and liquid and gas fuels allocated to it by the federal government.

Auditors' Report

Directors of the Brazilian Nuclear Corporation (NUCLEBRAS)
Rio de Janeiro, RJ

1. We have examined the financial statement of the Brazilian Nuclear Corporation (NUCLEBRAS) dated 31 December 1979 and the respective statements of changes of the liquid assets and of the sources and applications of funds for the fiscal year ending on that date. Our examination was made in accordance with generally accepted auditing standards and consequently includes examination of the accounting records and other auditing procedures we deemed necessary under the circumstances.

2. Previously, we examined and issued our reports on the financial statements for the fiscal year ending on 31 December 1978, the figures of which are being presented for purposes of comparison.

3. In our opinion, the financial statements referred to in Paragraph 1 above, properly represent the patrimonial and financial situation of the Brazilian Nuclear Corporation (NUCLEBRAS) as of 31 December 1979; the changes of its liquid assets and the sources and applications of funds for the fiscal year ending on that date, according to generally accepted accounting principles applied in a manner consistent with the previous fiscal year.

Rio de Janeiro, 17 February 1980

Boucinhas, Campos & Claro S/C: CRC.SP - 5,528-3 - RJ

Sergio Brilhante de Albuquerque: Accountant - CRC-RJ-18,064-2

Report of the Fiscal Board

The fiscal board of the Brazilian Nuclear Corporation (NUCLEBRAS), through its undersigned regular members Colombo Machado Salles, Paulo Cabral de Araujo and Walter Barros da Silva and in compliance with the legal provisions governing stock companies in Brazil, has examined the financial statements, the explanatory notes and the annual report of the executive board on the business of the corporation. It has also examined the proposal to be submitted for deliberation at the next regular general assembly to make effective the capitalization of the capital reserve formed as of the closing balance of the fiscal year 1979 and resulting from the monetary correction of capital received, as well as of the correction, for the same indices of authorized capital, in accordance with the provisions of Articles 167 and 168, Paragraph 2, of Law 6,404/76, respectively, consequently changing the par values of shares from 1.10 cruzeiros to 1.62 cruzeiros; the subscribed and integrated capital from 1,842,564,185 cruzeiros to 2,720,772,316 cruzeiros; authorized capital from 5,449,473,700 cruzeiros to 8,021,048,919 cruzeiros, corresponding to 2,970,758,859 common shares and 1,980,505,906 preferred shares.

Having received from the administration all of the information and explanations necessary for the performance of its legal and statutory mission, the fiscal board is of the opinion that the accounts, the financial statements and the respective explanatory notes and the annual report merit approval, and declares further that the aforementioned proposal is in accord with legislation pertaining to corporation statutes and, therefore, merits the approval of the regular general assembly of stockholders of the corporation.

26 March 1980

Colombo Machado Salles, Paulo Cabral de Araujo, Walter Barros da Silva

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BRIEFS

URANIUM PROSPECTING--The American enterprise Anschutz Corporation reported yesterday that uranium prospecting will markedly increase in the departments of Canendiyu, Pedro Juan Caballero, Caazapa, and Guaira. [Asuncion HOY in Spanish 17 Apr 80 p 7 PY]

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ENERGY MINISTER REJECTS FOREIGN PRESSURES

PY121823 Montevideo Radio El Espectador Network in Spanish 1600 GMT 12 May 80

[Text] Uruguay will not accept political pressures because of its energy needs. This statement was made by the industry and energy minister today when he inaugurated the conference on the utilization of low and medium-power nuclear reactors in Latin America.

At the same time Minister Francisco Tourreilles indicated that Uruguay has not established its policy for the utilization of nuclear power to generate electricity. He emphasized that a confrontation between the superpowers will not be allowed to hinder Uruguay's economic development.

[Begin Tourreilles recording] We will not be put into the position of having to endure political pressures because of our energy needs. Neither will we allow any possible confrontation between the superpowers in the area of the Persian Gulf or anywhere else to hinder our development. Therefore, we want to keep all our options open.

Although our country has already established the bases for a nuclear policy, it has yet to take a position with regard to nuclear energy. However, we are constantly engaged in training local personnel in order to be ready to evaluate--in due time--the various options offered by the different reactors and fuel cycles, especially those which use thorium, of which our country has proven reserves. [end recording]

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BRIEFS

NUCLEAR ENERGY COMMITTEE--The chairman of the newly appointed committee of inquiry into the restructuring of South Africa's nuclear activities, Dr Ampie Roux, says the solution to the world's energy problems undoubtedly lies in the increased use of nuclear energy. Dr Roux, who is also chairman of the South African Uranium Enrichment Corporation, said his committee had been formed with the view to the growing importance of nuclear energy. One of its main tasks would be to investigate the criticism that had been leveled against the use of nuclear energy. It would also investigate the exportation of South African expertise to other countries. Other matters to be investigated by the committee, Dr Roux added, included more efficient research in South Africa, the extension of uranium enrichment activities and whether South Africa should acquire more nuclear power stations. The question of whether South Africa should sign a nuclear nonproliferation agreement was a political matter and it was unlikely that the committee would give any attention to it. [Text] [LD170901 Johannesburg International Service in English 0400 GMT 17 May 80]

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SOVIET-BUILT NUCLEAR POWER PLANTS SHOW DEFICIENCIES

Hamburg DER SPIEGEL in German 5 May 80 pp 160-162

[Text] On an island off the south Finnish coast 200 Soviet technicians are carrying out repairs on a brand new nuclear reactor. They have been working for a year.

The Soviet Novovoronesh type reactor is supposed to power the Finnish generating station Loviisa. But the red pressure chamber, which is the heart of any nuclear reactor, revealed unacceptable deficiencies after the very first load test: a dozen cracks appeared in the anticorrosion jacket required by the buyer, the State Power Company Imatran Voima Oy (IVO). This jacket is a 9-mm thick layer of high-quality stainless steel which is welded to the inner wall of the chamber.

Western nuclear technicians fear a disaster anyway, whenever Novovoronesh is mentioned. Because of their cheap construction and simple safety measures these mass-produced Soviet 440-megawatt reactors (abbreviated: "VVER-440") are currently regarded as particularly prone to a lethal accident that will contaminate the environment.

The Eastern nuclear lobby always dismissed such fears as anticommunist defamation propagated by the Western multinational oil companies "to stimulate peoples' fears" and to damage the economy of the USSR, in the words of one complaint from Moscow about the TIMES of London.

But such fears about Soviet nuclear technology are apparently not completely unfounded. This is proved by the actions and experiences of the Finns, the only Western industrial nation to have acquired two "VVER-440" plants and to have one of them in operation.

The Institute for Radiation Protection in Helsinki, a nuclear technical inspection organization (TUeV) which tests according to Western standards, refused to grant an operating permit for the second reactor, which the Moscow Atomenergoeksport had delivered in May 1978. The director of the institute, Prof Antii Vuorinen, said: "The reactor should never have been installed. It would have been better to repair it on the spot in the Soviet Union."

There, says the head of the Loviisa generating plant, Anders Palmgren, Finnish technicians had already discovered "indications" of possible welding failures, caused either by outdated welding techniques or careless workmanship.

It was consideration for their partner in political dialogue to the East that made IVO take delivery just the same of the pressure container designed to accommodate 349 fuel rods. A delay in delivery, or outright refusal, would have resulted unavoidably in political unpleasantness with Moscow.

Soviet nuclear prestige is very much at stake in Loviisa. It was there that Finnish President Kekkonen and Soviet Premier Kosygin together pressed an extra large-sized button and--symbolically--started the first VVER-440 reactor, named Loviisa I.

Until now it has been mostly trouble-free, 80 of its capacity could be used annually. Easter 1980 saw an anniversary: 10 billion kw hours, the total national requirement for 4 months, had been fed into the Finnish power grid. Palmgren had words of praise: "The Soviets are excellent nuclear technologists."

The model Finnish plant, as sterile as a modern hospital, aroused interest in the Novovoronesh reactors outside the Eastern economic bloc CEMA. Iraq, Libya and Cuba, and even the NATO-member Turkey, called on IVO as potential customers, and not just out of interest in the peaceful uses of nuclear technology.

The WASHINGTON POST already predicted that the VVER-440 reactor from Finland might be a product with which the Soviet Union could "conquer a large segment of the nuclear market," which would pose an "economic threat to the West."

Such a threat is hardly likely: compared with Western nuclear plants Loviisa has a low output and is also much too expensive. According to its own figures IVO had to put over 1 billion Finnmarks (DM 470 million) into the construction of the plant, and the figure is probably considerably higher.

Construction costs, Palmgren himself admitted, were the same as for the 660-megawatt Swedish Asea boiling water reactors, of which Finland bought two units for the generating plant in Olkiluoto near the Baltic port of Rauma. But they cost 4.8 billion Finnmarks, more than 2 billion each.

A great deal of self-interest can be detected in the hymns of praise sung to Soviet nuclear technology by IVO management: it wants to complete an ambitious nuclear power program before the latent opposition to nuclear power plants, following the example of Sweden, increases among politicians and the people. Already 59 percent of the Finns have expressed themselves in an opinion poll against further construction.

If, after completion of the repairs, Loviisa II were to begin production at the same time as the completed reactor Olkiluoto II, about the middle of the year, the Finns would outstrip the leading European nuclear power producers, Sweden and Belgium, on a per capita basis. The four nuclear plants would meet 12 percent of Finland's energy needs, the Swedish ones only 5 percent.

IVO is even hoping to obtain permission from the government in 1982 to purchase a 1,000-megawatt reactor.

Loviisa I was so expensive in part, because the Finns remodeled the Soviet original extensively. The safety equipment and precautions were inadequate in their eyes.

Following a Dutch idea they inverted over the reactor a 70,000 cubic meter containment, consisting of an external concrete and an inner steel cap, a disaster protection device that the Novovoronesh originals in Eastern Europe do not have. Significantly enough, it was the Soviet contractor who insisted on this antiexplosion protection, apparently in order not to discredit its products outside the East bloc.

IVO had technical guidance in the instrumentation and computer control for Loviisa from the Federal German KWU, purchases were made through the Finnish subsidiary of the Siemans Co. Under license from the U. S. nuclear energy giant Westinghouse Finnish companies constructed the ice condensor for the vital emergency cooling for the event of reactor overheating.

"Eastinghouse," not exactly flattering for the Soviet nuclear technicians. The reason is that the Loviisa reactors now only contain one-third of the original Novovoronesh parts. The only ones to be saved were the steel components: pressure container, primary steam and hot water system circulation pipes, turbines and generators.

Vuorinen's deputy, Tapio Eurola, head of the "Department of Reactor Safety" at the Institute for Radiation Protection, is certain: "We could never issue an operating permit for the Novovoronesh reactors as they were built originally."

Unmoved, the Soviet manufacturer claimed that the defects that occurred in Loviisa II were in no way detrimental to the safety of the reactor. The Russians, a Swedish TV reporter learned, were carrying out the repairs "under protest," as far as safety is concerned they think everything is "just fine."

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LAW ESTABLISHING NUCLEAR SAFETY COUNCIL PUBLISHED

LD020919 Barcelona LA VANGUARDIA in Spanish 26 Apr 80 p 13

[EUROPA PRESS report: "Nuclear Safety Council Established"]

[Text] Madrid, 25 April--The OFFICIAL GAZETTE has published the law setting up the Nuclear Safety Council which is defined as a public body independent of the state administration, with its own legal status and the only competent body in the sphere of nuclear safety and radiological protection.

It will be governed by its own statute, drafted by the Council and approved by the government, copies of which will be given to the industry and trade committees of both chambers prior to its publication.

The Nuclear Safety Council's duties will be, among others, as follows:

--To propose to the government the necessary regulations in the sphere of nuclear safety and radiological protection, as well as the revisions which it deems advisable. Within these regulations the objective criteria for choosing the sites of grade I nuclear and radioactive installations will be laid down, subject to proposals made by the autonomous communities, pre-autonomy bodies or, in their absence, the provinces, in the manner and period to be determined in due form.

--To submit reports to the Ministry of Industry and Energy on the granting of prior authorizations, namely, authorizations for the siting of nuclear and radioactive installations which require this, and the granting of authorizations for constructing, putting into operation, running and closing down nuclear and radioactive installations.

--To conduct every kind of inspection in nuclear and radioactive installations, in transportation and in component plants during the various stages of planning, construction and putting into operation.

--To conduct the inspection and monitoring of installations while they are in operation.

--To cooperate with the competent authorities in formulating the criteria with which the emergency and physical protection plans for nuclear and radioactive installations and the transportation of nuclear and radioactive substances must conform.

--To control and monitor the levels of radiation inside and outside nuclear and radioactive installations.

--To grant and renew the licenses necessary for personnel operating the installations.

--To draw up research plans in the spheres of nuclear safety and radiological protection and to gather information on their development.

The Nuclear Safety Council will be comprised of a chairman and four council members who will be appointed from among people of recognized expertise in the fields of nuclear safety, technology, radiological protection and protection of the environment, medicine, legislation, and so forth.

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